Gas Journal

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Editorial Notes

Highway Lighting

In the House of Commons last week Mr. Salt, Unionist Member for the Yardley Division, Birmingham, urged the need for a national scheme for adequately lighting our highways in the interests of road safety and convenience and also for the prevention of crime. He moved an amendment to this effect, basing his argument on the Interim Report by the Departmental Committee on Street Lighting appointed by the Minister of Transport, which was published in October last. The findings of the Committee were the subject of comment in the "JOURNAL" for October 30, but we may remind readers that one of the main facts emphasized was the lack of co-ordination between the numerous local authorities in the matter of lighting, and their varying financial resources. It was mentioned that to light properly quite a small stretch of highway controlled by 24 different lighting authorities would, under the present system of local responsibility, mean a rate of 10s. in the £ to the smaller authorities, whereas the whole stretch could be adequately lighted, if the County Council was the lighting authority, for a county rate of approximately 0·65d. This was brought to the attention of the House by Mr. Salt. In seconding the amendment, Mr. Lyons, Unionist Member for Leicester East, appealed to the Minister of Transport to establish some kind of central authority in the form of a centralized Highways Board to tackle the question. Apart from Mr. Denman, who is the National Labour Member for Leeds Central, and who put in a plea for a return to darkness, Mr. Salt found support from all Parties.

Captain A. Hudson, Parliamentary Secretary to the Ministry of Transport, replied to the debate. He agreed that a national standard of lighting over the whole country for the most important roads was the goal to be attained. The Government, he said, were doing their best to get towards that goal, but in view of their already generous grants towards the maintenance of roads they did not feel at the present moment, and in present circumstances, that they could contemplate the necessary legislation to that end. He did not wish the House to think that what he had just said meant that having a national standard of lighting was being indefinitely shelved. It did not rule out the possibility of future action. In the meanwhile they must await the final report of the Departmental Committee and the results of the experiments which were being made.

He could assure the House that the Minister of Transport was fully alive to the problem of street lighting and was at present studying the whole subject with great care. While the Government could not promise immediate national action to set up a national lighting system for the whole country, they were endeavouring to enlarge the area as suggested by the Committee and thus ensure greater uniformity.

So the matter stands at the moment, but the debate in the House of Commons last week was indication of the great and growing public interest in the question of lighting our roads adequately. Though the Government contemplate no immediate move the present state of affairs cannot exist for long. The whole question is of vital concern to the Gas Industry, which supplies the illuminant for about 70% of the street lamps in the country. The policy of our Industry should be one of persistent effort to improve upon its present lighting results, so that if and when Government action is taken, and the lighting of our highways is nationally controlled, the claims of gas will receive full and unbiassed consideration.

A Fair Comparison

As we said last week, the Gas Industry will follow with great interest the progress of the Bills of the Gas Light and Coke Company and the York Gas Company through the House of Commons Committee Stage. The purpose of these Bills is to make it impossible for the local authorities concerned to render ineffective the provisions of the Gas Undertakings Act, 1934, which established the right of the tenants of Council Houses to choose whether they used gas or electricity for any or all purposes. While these Bills are under consideration it is interesting to note the result of a questionnaire sent by Bolton's Housing Director to over 150 tenants on a recently erected all-electric housing estate. The questionnaire asked the tenants to state their views on the installation of gas or electric wash-boilers and cookers. The replies—and it must be remembered that the tenants had had experience

of both gas and electricity—were overwhelmingly in favour of gas. And the outcome? Very wisely the Bolton Housing Committee has decided to install gas appliances for heating and cooking in the 300 houses which are being erected at Willows Lane—an estate, by the way, previously intended to be all-electric. When a fair comparison is allowed, the speed and economy of gas leave electricity well behind every time.

[A report of the first day's hearing of the Gas Light and Coke Company's Bill appears on later pages of our issue to-day.]

A Time of Testing

THE American Gas Industry enhanced its reputation for service during the almost overwhelming catastrophes due to the recent floods which ravaged New England, New York, Pennsylvania, Ohio, West Virginia, and Maryland. The Industry met the challenge with a courage and resourcefulness which call forth the greatest admiration. We learn from an American correspondent of the heroic efforts of gas undertakings to maintain a gas supply in face of tremendous odds. The Industry may well be proud of the manner in which gas service was rendered in a score of communities under most distressing and exacting conditions. In Hartford, Connecticut, for instance, which was paralyzed by the floods, 80% of the Hartford Gas Company's consumers enjoyed an uninterrupted supply of gas, while electric service was interrupted for several days. Throughout, relatively few of the stricken communities were without gas at a time when a supply of heat was sorely needed and when electricity, transportation, and communications failed. Then there was the tornado which swept through Tupelo, Mississippi, killing two hundred and leaving damage estimated at $4,000,000. Gas service was not interrupted in the business district, and the office of the Mississippi Public Service Corporation, which is equipped with gas lighting, was used as an emergency hospital, nurses and doctors being able to render medical services. The public of America have had an impressive demonstration of the reliability of gas and of how the American Gas Industry interprets Service.

Another Coalite Plant

IN our news pages to-day we give particulars of the decision of Low Temperature Carbonisation, Ltd., acting through a subsidiary concern to be named the Derbyshire Coalite Company, Ltd., to erect a large "Coalite" plant adjacent to the pits of the Bolsover Colliery. The present agreement provides for over 6 million tons of coal, but the Directors state that this quantity may be increased considerably later. The capital, subscribed for and owned by the parent Company, for the new venture amounts to £200,000, and the aim is to have the plant in readiness for next winter's demand. The installation, we understand, will be capable of dealing with more than 180,000 tons of coal a year.

This further enterprise of Low Temperature Carbonisation, Ltd., is indication—if, indeed, indication is now needed—of the public demand for a first-class solid smokeless fuel, and it will be assured of the support of those who desire a cleaner and healthier atmosphere. We hope, too, that this and other ventures will spur on our own Industry to greater efforts to market satisfactory solid smokeless fuel. Given the right product, there is, as we have long emphasized, plenty of business to go round. There will, we suggest, be general agreement with us when we say that Colonel W. A. Bristow, Chairman and Managing Director of Low Temperature Carbonisation, has transformed the status and prospects of his Company; we wish him luck in Derbyshire.

Petroleum in Britain

IN the closing days of March, the first deep bore-hole to be put down for the purpose of finding petroleum in this country was begun near Portsmouth. The event was given due prominence in the popular Press and is now a matter of history. Whether history will record the fact as one of industrial importance will not be known for some time, possibly not for two or three years. Although, therefore, at the present time, there are more immediately important matters to occupy our attention, it is at least interesting to speculate upon what the effect might be upon the Gas Industry of the possible discovery of a petroleum field in this country. It might, indeed, have a profound bearing on the whole policy of the Industry, and on the technique of gas manufacture and distribution.

This might arise from two causes; the first the production of oil, and especially of gas oil, in large quantities, and at a price low compared with its present cost; the second that petroleum is usually found in association with natural gas. If gas oil became cheapened in price, should we find that it would be cheaper to manufacture carburetted water gas than coal gas, so that the technique of gas manufacture would follow the lines already developed in the U.S.A.—the home alike of cheap gas oil and of C.W.G.? The alteration in methods that this would entail would, however, be as nothing to the revolution that might follow the discovery of natural gas in quantities comparable to those found in other parts of the world. According to Brame and King in "Fuel," some 7 million cu.ft. of natural gas is already recovered at Heathfield and is distributed for heating and lighting in the immediate neighbourhood. The amount of natural gas *utilized* in other parts of the world is very great. In 1920, for example, the U.S.A. utilized some 2,000,000 million cu.ft; in 1930 Canada utilized nearly 30,000 million cu.ft.; and in 1932 so small a country as Roumania used 63,000 million cu.ft. To convert these figures into terms of coal gas it is necessary to remember that, when gasoline has been extracted from the natural gas, the calorific value of the resulting gas is generally between 900 and 1,200 B.Th.U. per cu.ft. The figures for gas consumption just given must therefore be multiplied at least by a factor of 2. Having done this it is well to remember that the total gas consumption in this country is of the order of 300,000 million cu.ft. With any considerable discovery of oil in this country it is evident that it might be possible to supply most of England—we omit Scotland and Wales because no borings are yet being made there—with natural gas.

It must be borne in mind, moreover, that the figures just given are for gas used, not for gas produced. It has been calculated that in practice some 25% of the gas produced is wasted completely, especially in the U.S.A., because by law every owner of ground is allowed to capture as much petroleum from the field below his surface as he can. In consequence wells are multiplied and the gas escapes. In one field alone, the Panhandle field, it is calculated that not less than 1,000 million cu.ft. of natural gas is blown into the air each day. In this country, as a preliminary to boring, the legal position was made secure so that those who have obtained an oil licence have the sole power to control the field, and it is likely that any natural gas obtained would be conserved. The fact that natural gas occurs at Heathfield and that a bore hole is to be put down in Sussex would seem to remove such speculations from the realm of madness.

Possible Effects

NATURAL gas is frequently obtained under very high pressures, and it can thus be transported long distances in pipe-lines—because the cost of compression is nil. It does not seem entirely impossible that the South and Midlands of England at least might be supplied by natural gas at some future time; and that is a distinctly disturbing thought. What of gas appliances? Obviously the Industry could not alter all its apparatus to take gas of 1,000 B.Th.U.; the alternative would be to install blue water gas plant and to dilute the natural gas at the gas-works. What of coke sales? The Gas Industry, if it distributed natural gas would cease to produce coke, and might even become a very heavy user of coke. Our present gas-works would be no more than stand-by plant. Whether or not we should wish to see natural gas and petroleum discovered in England we do not altogether know. It seems rather like a bad dream. If, however, the result was to cheapen gas, and/or to increase national safety, we could not wish it otherwise. We certainly do not suggest that the Gas Industry should as yet suspend development on present lines on the strength of any probability!

One possible result might be a national gas grid. The initial capital cost as reflected in the cost of gas transmission prohibits national gas grids in this country according to most present calculations. Petroleum fields and wells do not last as long as coal fields, and within a few years such sources as might be discovered in this country might be worked out and the supply both of oil and of natural gas would fail. It is not without significance that, according to a recent Paper in the *Petroleum Times* by Messrs. V. R. Garfias and R. V. Whetsel, the United States is already within measurable distance of being an oil importing country instead of an oil exporting country. If natural gas were discovered in this country the result might be to leave a later generation with the heritage of a national Gas Industry and a national gas grid put down in the first place under economic conditions, that might prove very valuable in the future.

Instalments in Advance

NOT so long ago, any suggestion to extend the principle of the Christmas Club to our great railway systems would have appeared to many people ludicrous; but time brings its changes, and the "extraordinary" of to-day becomes the "ordinary" of to-morrow. So has it been in this case. In the early part of the present year, certain of the railways, if not all, introduced schemes whereby it is possible for intending travellers to save up by instalment payments for journeys by rail, either for holidays or for any other purpose, except for purchasing season tickets or tickets to Continental destinations. Special stamps of the value of 1s. are on sale to the public at the stations and offices of the railway companies concerned, and cards providing spaces for ten of these stamps to be affixed thereto are supplied. When these cards are completed, they are exchangeable for vouchers to the value of 10s. As these vouchers bear interest for each completed calendar month up to twelve months, there is an incentive to change the cards for them as soon as they are fully stamped.

Now comes the news that the "save-to-travel" scheme is proving extraordinarily popular, each succeeding month showing a substantial increase in the sale of stamps; and one wonders whether so promising an innovation for the railways is not capable of more widespread adoption. Anyway, such a method of instalments in advance would be a welcome change from the other kind of instalment which has soared to giddy heights of popularity. Is it not possible for the Gas Industry to make some use of the railway companies' plan? Only a few days ago, Mr. R. J. H. Clark, in his Presidential Address to the Southern Association of Gas Engineers and Managers, mentioned the fact that the Plymouth Gas Company realize every house still harbouring a black cooker to be fertile ground for the blandishments of our rivals, but any comprehensive effort to get rid of them comes up against the question of cost—and a very formidable obstacle it is.

So far as his slot consumers are concerned, Mr. Clark told his fellow members that sound means have been introduced to overcome the difficulty. In their case, the Board decided to offer a high-grade all-enamel cooker in exchange for the all-black one, and to cover the higher price and increased maintenance cost by a hire charge of 1s. 4d. per month, or 1s. 6d. if fitted with automatic oven heat controller. This still leaves the ordinary consumer to be dealt with, and possibly the usual hire-purchase terms might be considered as meeting his case. After all, the customary railway journey is not long enough for the traveller to "pay as he rides."

But we have before us Mr. Clark's testimony that the experience of his Company clearly indicates that the problem of the black cooker really calls for very serious consideration and prompt action, and there is just a possibility that some means might be found of pressing the railway stamp and voucher method into the service. By getting the money gradually in advance in this way, it might be practicable to offer tempting purchase terms to the consumer, and a point to be borne in mind is that the consumption of gas would not suffer in the meantime, as presumably the black cooker would remain in use until the enamelled cooker to replace it had been paid for.

Forthcoming Engagements

May.

6-7.—EASTERN COUNTIES GAS MANAGERS' ASSOCIATION.—Spring Meeting at Lincoln.

7.—SOUTHERN ASSOCIATION OF GAS ENGINEERS AND MANAGERS (EASTERN DISTRICT).—Discussion Meeting, 28, Grosvenor Gardens, S.W. 1.

7.—MIDLAND ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—Spring Meeting at Northampton.

7.—MIDLAND JUNIOR ASSOCIATION.—Annual General Meeting. Address by Mr. E. W. Smith.

8.—NORTH OF ENGLAND G.M.A.—Annual Meeting at Newcastle and Lecture by Prof. J. W. Cobb, C.B.E.

9.—SCOTTISH EASTERN JUNIOR ASSOCIATION.—Annual General Meeting.

11.—W.G.C.—Executive Committee Meeting at 28, Grosvenor Gardens, S.W. 1, 2.30 p.m.

12.—N.G.C.—Central Executive Board Meeting, 11.45 a.m.

12.—N.G.C.—Annual General Meeting, May Fair Hotel, London, 2.30 p.m., preceded by Luncheon.

12.—FEDERATION OF GAS EMPLOYERS.—Central Committee Meeting, 11.30 a.m.; Eighteenth Annual General Meeting, 3.15 p.m.

13.—S.B.G.I.—Council Meeting, 11.30 a.m.

13.—S.B.G.I.—Annual General Meeting, May Fair Hotel, London, W. 1, 2.45 p.m.

13.—YORKSHIRE JUNIOR ASSOCIATION.—Meeting at Leeds with Salesmen's Circle.

19.—I.G.E.—Gas Education Executive Committee, 2.30 p.m.

20.—B.C.G.A.—Executive Committee Meeting, 11.30 a.m.; General Committee Meeting, 2.30 p.m.

21.—WALES AND MONMOUTHSHIRE ASSOCIATION OF GAS ENGINEERS AND MANAGERS.—General Meeting at Monmouth.

26.—W.G.C.—Annual General Meeting at Londonderry House, Park Lane, W. 1, at 3.30 p.m.

26-29.—I.G.E.—Annual General Meeting.

June.

8.—I.G.E.—Finance Committee, 1.45 p.m.; Membership Committee, 2.15 p.m.; General Purposes Committee, 3 p.m.

9.—I.G.E.—Council Meeting, 10 a.m.

16.—I.G.E.—Gas Education Executive Committee, 2.30 p.m.

18.—I.G.E.—Refractory Materials Joint Committee (Stoke-on-Trent), 2.30 p.m.

PERSONAL

We learn that Mr. J. E. O. HEWETT, who is retiring from the Birmingham Gas Department after 38 years' service, was presented by the Birmingham Gas Committee on April 27 with an illuminated address on vellum in recognition of his services. During 26 years of Mr. Hewett's service he occupied the position of Distributing Engineer. In that period the total length of the mains in the area of supply increased from 777 to 1,727 miles. In making the presentation, Councillor A. S. Giles, Chairman of the Gas Committee, said that the work Mr. Hewett had done would remain a permanent testimony to the efficiency of his services.

* * *

We learn that Mr. W. BRADLEY, of the County Borough of West Bromwich Gas Department, has been appointed to the position of District Superintendent for the Wetherby Area of the Harrogate Gas Company.

* * *

In connection with the joining of the Rotherham and District Collieries Association, Ltd., by the Nunnery Colliery Company on and from May 1, 1936, we are informed that Mr. E. V. S. PEPPER, a Director of the Nunnery Colliery Company, Ltd., is joining the Board of the Rotherham and District Collieries Association, Ltd.

* * *

Mr. W. DALLAS, who retired from the position of Secretary of Broadstairs Gas Company (a post he had held for twenty years) at the beginning of April after a service of over forty-one years with the Company, has been presented with a suitable memento of the occasion by the employees of the Company.

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On the completion of fifty years' service with the Bilston Gas Light and Coke Company, Mr. A. BRADFORD LEGG, Secretary, was the guest of honour at a complimentary dinner given by the staff and presided over by the Engineer and Manager, Mr. H. S. Adams. On behalf of the staff, Mr. Adams presented Mr. Legg with a handsome china cabinet, which was suitably inscribed, and an illuminated address. Every member of the staff was present and three members of the Board attended as guests.

News in Brief

The First Annual General Meeting of the Women's Gas Council will be held at Londonderry House, Park Lane, W. 1, on Tuesday, May 26, at 3.30 p.m.

A Scheme for the Linking Up of the Chorley and Adlington gas mains consequent upon the acquisition by Chorley of the Adlington Gas Undertaking has been drawn up and approved.

A New Edition of the "Principles of Combustion in the Steam Boiler Furnace," by Arthur D. Pratt, has been published by Messrs. Babcock & Wilcox, Ltd., to whom we are indebted for a copy of this very useful work.

A Final Dividend on the ordinary shares at the rate of 3% per annum, less tax, for the year ended March 31, 1936, making with the interim dividend of 2% a total of 5% for the year is recommended by the Directors of the South-Western Gas and Water Corporation, Ltd.

A Three-Days' Exhibition organized by the Bude Gas Company was opened by Mr. A. Banbury at the Headland Pavilion on April 29. Mr. Selby, Works Manager, spoke of the success which attended the Company's exhibition last year. Demonstrations of gas cookery were given by Miss Sybil Curd.

A Final Dividend of 3% actual, less tax, on the ordinary shares, making with the interim dividend already paid, 6% actual, less tax, for the year ended March 31, 1936, is recommended by the Directors of the South-Eastern Gas Corporation, Ltd. The General Meeting will be held on May 13.

Members of The Institution of Gas Engineers are invited to attend the Annual General Meeting on May 12 of the Illuminating Engineering Society, reference to which was made on p. 216 of our issue for April 22. Tickets of admission may be obtained from the Secretary of The Institution of Gas Engineers.

The Following British Standard Specifications may be obtained, price 2s. each, from the Secretary of The Institution of Gas Engineers, 28, Grosvenor Gardens, S.W. 1: No. 398-1936: "Symmetrical Light Distributions from Lighting Fittings" (superseding No. 398-1930); and No. 667-1936: "Photo-electric Type Portable Photometers."

Despite the Rejection by the Accrington Town Council of an experimental street lighting plan by the Accrington District Gas Board, the question of improving the general lighting of the Borough has not been allowed to drop. The Electricity Committee and the Gas Board are now to be given an opportunity of experimenting side by side in a small area.

Successful Demonstrations of practical gas cookery by the Broadstairs Gas Company were held at St. Peter's Hut from April 27 to May 1, the opening ceremony being performed by Mr. E. F. Smallbone, Engineer and Manager. Cookery demonstrations were given each afternoon and evening by Miss E. Kirby, M.R.S.T., M.C.A., of the Radiation Research Kitchen. Other attractions included a cake baking competition and a special show of films.

A Lecture in the Bury Gas Showrooms, Market Street, on April 30, was attended by members of the Women's Section of the Bury Branch of the British Legion. Ald. Bradley presided, and Mr. R. Malone, of the Gas Department, gave an Address on the modern uses of gas and its advantages. Miss K. Lamb then thanked the Chairman and Mr. Malone on behalf of the members.

Cookery Demonstrations and an Exhibition of modern gas appliances, organized by the Rossendale Union Gas Company, Ltd., was held from April 28 to May 2 at the Mechanics' Hall, Bacup. The demonstrator was Miss Z. Fitzgerald. Washing machine demonstrations were given by Miss R. Stott, of Messrs. W. H. Dean & Son, Ltd. The demonstrations were extremely well attended.

"**The Provision of a New Gasholder** is absolutely necessary in the interests of the gas undertaking and the consumers," said the Town Clerk (Mr. Arthur Culwick) at a Ministry of Health enquiry at Oldbury on April 30 in connection with an application to borrow £25,000. He added that the total available capacity at present was 840,000 cu.ft., as one of the smaller holders could only be utilized partly owing to its worn-out condition. It is intended to erect the proposed new holder partly on the site of the worn-out one. Since 1910 the output of gas had increased from 135 million cu.ft. to 342 million cu.ft. for the year ended March 31, 1936.

1936 "JOURNAL" DIRECTORY

Page	4.	ASHBY-DE-LA-ZOUCH. G. H. Matlock, E. & M., deceased.
Page	10.	BRADFORD-ON-AVON. J. V. Knight appointed M. vice E. A. Sainsbury, retired.
Page	10.	BRIDLINGTON F. S. Hunter appointed E. & S.
Page	14.	CAMBRIDGE. H. Shewring, E. & M., deceased.
Page	28.	GLOUCESTER. F. W. Rogers appointed S. vice T B. James, retired
Page	38.	KING'S LYNN. J. V. Knight, E. & M., transferred.
Page	50.	ORMSKIRK. N. B. Thompson appointed E. & M. vice F. S. Hunter, resigned.
Page	62.	SKIPTON. N. B. Thompson, E & M., resigned.
Page	66.	SWAFFHAM. J. V. Knight, E. & M., transferred.
Page	68.	TROWBRIDGE. J. V. Knight appointed M.
Page	72.	WARMINSTER. J. V. Knight appointed M. vice E. A. Sainsbury, retired.
Page	72.	WELSHPOOL J. H. Canning, Jnr., appointed M. & S. vice T. E. Ashley and R. Owen, retired.
Page	92.	VALE OF LEVEN. J. Lang, E. & M., deceased.

The North of England Gas Managers' Association are holding their Annual General Meeting in the Demonstration Theatre of the Newcastle-upon-Tyne and Gateshead Gas Company, Grainger Street, Newcastle, on Friday, May 8. Following luncheon at the County Hotel, the President (Mr. W. M. Galleway, of Whitby) will take the chair at 2 p.m. A lecture, entitled "Furnace Atmospheres and their Effects," is to be given by Prof. J. W. Cobb, C.B.E.

A Strong Plea for Gas Lighting was made by the Chairman (Capt. A. E. Williams, O.B.E.) at a recent meeting of the Margate Hotel and Boarding House Association last Friday evening when he said: "My considered advice to boarding house keepers who have gas laid on in the house is to illuminate lobbies, halls, kitchens, sculleries, &c., with gas. It can be fixed up at little trouble and expense to existing pipes, and you will find that it will give you a material reduction in your lighting bills."

The Rugby League Australian Tour was the subject of a splendid "link-up" display at the showrooms of the Widnes Gas Department. "It is only in keeping with the characteristic enterprise of the Widnes Gas Department," runs the Widnes *Weekly News* for April 24, "that a special feature should be made of the departure of one of their colleagues, McCue, on an adventure to solve the riddle of the ashes." While the hardy exponents of the Rugby League game are about to settle the burning question of the destination of the "ashes," the Gas Department humorously draws attention to the fact that no riddle of the ashes exists in Widnes.

A Lightning Strike of all municipal workers of the Tredegar Council occurred on the night of April 28 over the appointment of an ambulance driver and mechanic in preference to one who had been in the employ of the Council as a motor driver for over fifteen years. The Gas Department was involved, but Mr. D. Walter Davies, Engineer and Manager, was equal to the occasion and, with a day's supply of gas in stock, saw the town through its dilemma, for the men resumed work on April 29 on the understanding that there would be no recurrence of the trouble. The Council against whom the strike was directed is composed of fifteen Socialists and one Independent.

The Carbonizing and Steam-Raising Plant at the Rochdale Gas-Works was discussed at the meeting on April 30 of the Finance Committee of the Rochdale Corporation, who had before them the proposals of the Gas Committee for their renewal. A report on the condition of the plant had been presented by the Engineer at a special meeting of the Gas Committee on April 28. This report stressed the urgent need for the renewal of the plant, and after an inspection of the Works the Gas Committee decided to confer with the Finance Committee on the financial considerations involved. The Finance Committee agreed to the proposals and the Council will be asked to approve the Committee's recommendation that tenders for the work be invited.

That Joint Gas and Electricity Showrooms should be provided in three areas of Salford is proposed by Ald. J. F. Crane. His idea is that this would be the means of effecting closer co-operation between the two Departments which are controlled by the Light, Heat, and Power Committee. He contends this change would be of great advantage to ratepayers because when paying their electricity and gas accounts they would have the opportunity of inspecting all the latest appliances for domestic use. It would, perhaps, also encourage some of the prominent manufacturers of electrical and gas fittings to hold demonstrations at the showrooms. The Light, Heat, and Power Committee has decided to refer the scheme to the Finance Committee to report on the financial aspect of the proposal.

Neath Will Not Sell Gas Undertaking

Offer of United Kingdom Rejected

By thirteen votes to three the Neath Borough Council rejected the recent offer of the United Kingdom Gas Corporation, Ltd., to purchase the Undertaking of their Gas Department.

At a previous meeting, which was held in private, it is understood that an offer of £177,000 was made by the United Kingdom Gas Corporation, but was turned down.

During the debate it was pointed out by Mr. D. G. Davies that if the Undertaking were sold the Council would be able to pay off the £70,000 debt thereon and invest the balance for the benefit of the ratepayers. Alderman Joseph Branch, however, observed that the Undertaking was already bringing in as much as would be realized from any investments.

Amalgamation and Grouping

Severn Valley and Market Drayton.

The Severn Valley Gas Corporation, Ltd., announce that their offer to the shareholders of the Market Drayton Gas Company has been accepted by a substantial majority of the shareholders of that Company.

United Kingdom and Pickering.

Close Brothers, Ltd., the Secretaries of the United Kingdom Gas Corporation, Ltd., announce that the Corporation has recently acquired 98% of the Ordinary Shares of the Pickering Gas and Water Company.

Gas Display at Liverpool Exhibition

This attractive display was arranged by the Liverpool Gas Company at the recent Brighter Homes Exhibition held in that City.

Topical Display at Worcester

All India Cricket Team's Visit

An interesting topical window display was arranged by the Worcester New Gas Light Company last week to welcome the All India cricket team, which opened its tour at Worcester on Saturday, May 2.

In realistic fashion the window was designed to represent the Worcestershire County Cricket Ground, plainly showing the famous row of trees and the Cathedral in the background. "Gas welcomes All India" was the greeting across the top of the window. Beneath, on the representation of the county pitch, a bowler had just delivered a ball. The wicket, however, was well guarded by a gas fire, and at the bottom of the window was the appropriate caption "A Perfect Defence against a changeable climate. Thank goodness for Gas."

The ingenuity of the display attracted the attention of many passers-by as well as several members of the Indian team.

Wales and Monmouthshire Association of Gas Engineers and Managers

Programme for Annual Meeting

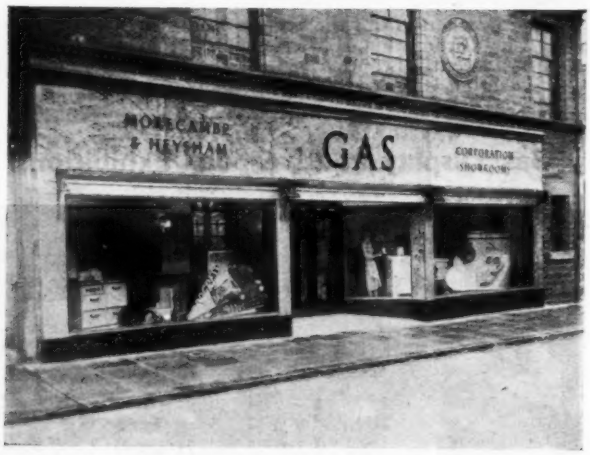
The Thirty-First Annual Meeting of the Wales and Monmouthshire Association of Gas Engineers and Managers will be held at Monmouth on Thursday, May 21, at 11 a.m., the chair being taken by the President, Mr. H. Matterface.

The Meeting will adjourn at 12.45 p.m. for Luncheon at the Beaufort Arms Hotel, Monmouth, where a charge of 3s. 6d. per person will be made.

On the kind invitation of the President, at 2 p.m. members will embark on a forty miles motor tour to enable them to see the beautiful country around Monmouth. A call will be made at the Gas-Works on the way. Tea will be taken at the Beaufort Arms Hotel, and arrangements will be made for at least one coach to return in time to permit Members to catch, if necessary, the 5.25 p.m. train from Monmouth. A train leaves Cardiff at 9.30 a.m., and

Newport at 9.50 a.m., arriving at Pontypool Road at 10.8 a.m., and the Secretary, Mr. Octavius Thomas, The Vicarage, Cymmer, Porth, Glam., has arranged with the G.W.R. for a special motor train from Pontypool Road to Monmouth.

Morecambe's Attractive New Showrooms



Further to our account in last week's "JOURNAL" of the opening of Morecambe's new gas showrooms, we now reproduce above a photograph which shows the attractive appearance of the exterior of the new premises, which have been converted at a cost of £1,800 from old Council offices.

Progressive Publicity at Buxton

Health and Beauty Lectures

The go-ahead publicity methods of the Buxton Corporation Gas Department continue to meet the success they deserve. Mr. F. G. Shaw, the Engineer and Manager, organizes cookery demonstrations twice yearly with the special object of obtaining greater use from gas cookers already installed. But Mr. Shaw is not content to let it go at simple cookery demonstrations, and always seeks for a novel note on these occasions. It is aimed at making the demonstrations entertaining besides being instructive, and last November a lightning cartoonist added an original touch while the cooking was in progress.

A further series of demonstrations are now being held at Buxton, and once again Mr. Shaw comes forward with an entirely new idea.

Lectures on "Health and Beauty" are to be given by an authority on this interesting subject, and the demonstration of simplified cooking via the "Regulo" will lose nothing by the health and beauty culture interlude.

In these days when bright ideas in gas propaganda and publicity are so very noticeable, Mr. Shaw's enterprise is worthy of special mention.

A Gas Grid for Fife?

Letter to Member for Linlithgowshire

We understand from a local corespondent that Mr. George Mathers, M.P. for Linlithgowshire, has received the following letter from the Caledonian Gas Corporation, Ltd., regarding the lighting of Dechmont village:

Sir,

We note the questions raised in the House of Commons on April 21 relative to the absence of lighting facilities at Uphall and Dechmont.

For your information we would like to point out that we hold a controlling interest in, among others, the Broxburn, Armadale, West Calder, Fauldhouse, and Stane and Dykehead Gas Companies, and that a large and comprehensive gas grid is about to be instituted forthwith. Contracts have been placed for plant and equipment, and there will be a total length of some 30 miles of new main laid, it being the intention to complete the work this summer. We would emphasize that no guarantees of any sort have been, or will be asked for, either from local Authorities or the consumers.

The following are among the places that will be served: Uphall, including Houston Mains, Dechmont, Bangour Village, Uphall Station, Pumpherston, Mid and East Calder, Oakbank, Seafield, Livingston, Addiewell, Longridge, Allanton, and Hartwood Mental Hospital. Residents in these areas have already been canvassed with gratifying results.

It should be noted that these places are additional to the districts already supplied by the Companies named. For instance, an extension is on hand at West Calder for the supply to the new housing scheme at Parkhead, and similar extensions are in hand at Whitburn, Armadale, and Broxburn.

Should there be any particular community, not included in the above schemes, you would like to have supplied, and you will be so good as to let us know, the matter would receive our immediate consideration.

It is the Corporation's intention to extend considerably the scope of its operations, and by co-ordination to effect economies in manufacture and administration, which benefits will enable them to provide the community with lighting, heating, and cooking facilities at competitive rates.

[Signed] William Wilson
(Technical Adviser).

Flexible Metallic Tubing

Metallic Tubing and Connectors

In last week's "JOURNAL" we mentioned that the British Standards Institution had issued a Specification for Flexible Metallic Tubing and Connectors for Portable Gas Appliances. The Specification is issued under No. 669, 1936, and is a very complete document embodying not only the dimensions of the tubing but also the quality of the materials which go to make up the assembled tube. Mr. S. F. Dunkley, of the Gas Light and Coke Company, Chairman of the Technical Sub-Committee which prepared the Specification, sends us the following comments.

The important aspect of the composition and tests for the rubber used for sealing and packing has been fully treated as well as the important question of quality of galvanizing, a special test having been devised to meet the requirements of both manufacturer and user.

Gauges are also provided for the protection spring, tubing, and connector ends.

Easily applied mechanical tests have been included for the assembled tube in respect of flexibility, tensile strength, and soundness.

The Specification appears to be a very complete one covering all the factors necessary to ensure the availability of an easily distinguishable, sound, and satisfactory tube, by the marking of each assembled tube with the manufacturer's identification number or trade mark, as well as the number of the British Standard Specification. Metal screwed ends have been adopted to ensure maximum safety in use.

The Specification was prepared under the supervision of the Gas Industry Committee of the British Standards Institution, and when in complete operation it should prove helpful to all concerned.

Copies of this Specification under reference B.S.S. No. 669, 1936, may be obtained from the Publication Department, British Standards Institution, 28, Victoria Street, S.W. 1. Price 2s. 2d. post free.

Topical Display at Stroud

This topical display was arranged by the Stroud Gas Light and Coke Company to link up with the well-known film—"The Guv'nor"—featuring George Arliss. We understand from Mr. Barber, the Sales Manager, that the display aroused a considerable amount of public interest.

"Stellite's" Second Acquisition

Hawarden to Receive Bulk Supply

A further acquisition by Stellite, Ltd., of Queensferry, Chester, is recently announced. This comprises the Undertaking of the Hawarden Gas Company, of which "Stellite" have purchased the entire share capital.

It will be recalled that in the "JOURNAL" for April 15 we announced that the Company had acquired the Connah's Quay Gas Company, and, further, that the Company intended supplying their surplus gas through high-pressure mains throughout the whole of the Connah's Quay area.

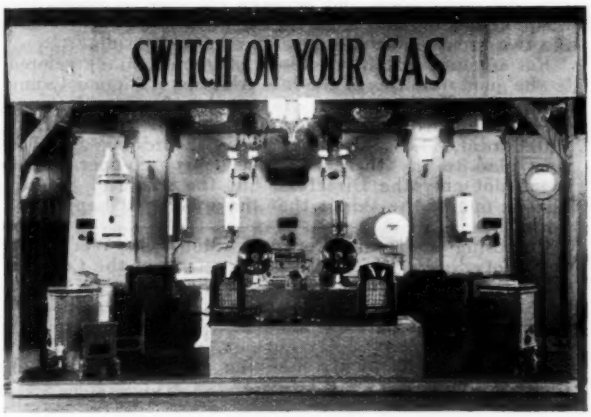
The Chairman of both the Connah's Quay and Hawarden Undertakings is Colonel A. D. Murray, D.S.O., who is also Deputy-Chairman of Stellite, Ltd.

The process employed by the Stellite Company which was referred to in our issue for Dec. 25, 1935, operates at medium temperatures to produce smokeless domestic fuel. The surplus gas has a calorific value of 750 B.Th.U. per cu.ft. This will, of course, be diluted before distribution.

The Company we learn have placed an order with Messrs. R. & J. Dempster, Ltd., Elland, for a purification plant to treat approximately one million cu.ft. of gas per day. It is expected to be in operation in about three months' time.

Exhibition and Cookery Demonstrations at Wishaw

On April 7, 1936, an Exhibition of modern gas appliances, arranged by the Gas Department of the Burgh of Motherwell and Wishaw was opened in the Y.M.C.A. Hall, Wishaw.



Bailie W. N. Pomphrey occupied the chair at the opening ceremony which attracted a large audience, and was accompanied on the platform by Ex-Provost T. S. McLees, Councillor Crichton, Councillor Welch, Mr. R. D. Keillor, Gas Engineer, Greenock, and Mr. A. McDonald, Gas Engineer and Manager, Motherwell.

The motto of the Exhibition, prominently displayed on the wall at the rear of the stage, was "Gas is indeed the housewives' treasure—it lightens work and increases leisure." And the appliances on view were all designed with that object in view. On the stand were displayed the latest types of water heaters, washing machines, all in various self-colour enamels, new types of radiators and clinical gas lamps for the treatment of rheumatism, sciatica, &c. Water heating appliances, all working, were prominently displayed and commanded a considerable amount of attention.

An interesting feature of the Exhibition was a special exhibit of the new Electrolux refrigerator, and in order to advertise the utility of the appliance for ice-making cooling drinks made with "Creamola Foam" were supplied free to the audience.

The other exhibitors were the Forth and Clyde and Sunnyside Iron Company, Ltd., who had on view a wide and varied range of all enamelled gas cookers and fires which attracted considerable attention, also John Wright & Co., Ltd., who were showing cookers, fires, and water heaters.

The cookery demonstrations held each afternoon and evening were in the capable hands of Mrs. E. Hardy.

The fittings and general arrangements were by the Gas Department under the supervision of Mr. McDonald, who carried out a scheme of lighting the excellence of which caused considerable comment.

Portable Photometers

New B.S. Specification

The value of a specification for portable photometers has grown with their extended use. A critical light-measurer must itself be trustworthy. It will not be so near precision as some other measures of physical quantities; but in various forms it can satisfy as a working measure, if it be made to a Standard Specification. Such a Specification, re-issued in a thoroughly revised edition last September ("No. 230-1935"), deals with the visual type of portable photometer. There the observer compares the illumination to be measured with that from a lamp in the instrument.

In other kinds no comparison-lamps were used. The light to be measured produces an electrical effect at a sensitive surface. The effect varies with the degree of illumination, which can therefore be expressed in figures (foot-candles) on a scale. The B.S.I. now prescribes for these instruments, too, by its publication of British Standard Specification No. 667, Portable Photometers (Photo-Electric Type). This Specification covers the requirements for portable photometers in which the test surface embodies a rectifier photo-electric cell.

No. 667 classifies two types of photometer: Type A for low illumination measurements, Type B for medium and high. The Specification also gives the effective range, the scale and figuring, the effect of temperature, the effect of colour of the light source, limits of error. Other clauses deal with oblique illumination, general design, and external finish. An Appendix shows how to correct for sources having large colour differences from the standard adopted. Copies of the Specification, No. 667-1936, can be obtained from the Publications Department, British Standards Institution, 28, Victoria Street, London, S.W. 1, price 2s. 2d. post free.

The Students' Text Book of Heating and Ventilation*

This excellent publication has been written in the hope that it will fill the longfelt need for a text-book closely related to present-day practice, sound and lucid on theoretical matters, and suitable for the use of students of Heating and Ventilating. "Its necessity," runs the preface, "is evidenced by the ever-increasing number of classes formed by technical schools all over the country, wherein both teachers and students alike are handicapped by the lack of such a book."

Beyond a vestige of doubt Mr. Norman Wignall, A.M.I.Mech.E., M.I.H.V.E., has a sympathetic appreciation of the "growing pains" of the would-be heating and ventilating engineer; and he has applied his extensive knowledge to great effect in the production of this thoroughly practical work. One cannot but feel that wherever the book is used the Author will earn the earnest gratitude of student and teacher alike.

The opening chapter deals with the fundamental question of the nature of heat—"fundamental" because the student of heating and ventilating will stand or fall on his knowledge of heat. Then follows "Fuels and Combustion." Since the theory of combustion is liable to become very involved, the Author has wisely decided not to go into the subject in detail, being of the opinion that it can scarcely be looked on as a subject in which the average heating engineer should specialize. At the same time, however, he fully realizes it is essential that the heating engineer should be acquainted with the principles so that he can obtain efficient results from his boiler.

In Chapter III.—"Boilers and Calorifiers"—are considered the different types of boiler usually found in practice at the present time. Having dealt with the features common to all boilers, Mr. Wignall goes on to describe selected types, and many typical examples are described and illustrated. In addition he describes various boiler mountings. And so on to "Heat Losses from Buildings," where the Author deals in turn with general principles, heat transmission coefficients, high ceilings, practical applications, &c. "Heat Transmission of Radiators" is the subject of Chapter V., which includes a section on the testing of radiators. Hot water heating systems, pipe sizing for gravity hot water systems, and hot water systems with forced circulation are explained in the next three chapters.

The Author then goes on to deal with steam heating systems, where he draws due attention to such important considerations in the lay-out of these systems as the

* By Norman Wignall, A.M.I.Mech.E., M.I.H.V.E. London: *The Heating and Ventilating Engineer*, 8, Southampton Row, W.C. 1. Price, 10s.

efficient drainage of condensation in the pipes and the removal of air from pipes and radiators. Concluding chapters deal with hot water supply systems, ventilation and the properties of air, and heating and ventilation. There is also an appendix dealing with the automatic control of various systems.

A series of test questions which the student should be able to answer when he has mastered the main contents of the book in addition to the appendix have been added since the main contents of the publication appeared in serial form in the *Heating and Ventilating Engineer* from January, 1932, to August, 1934. Wherever suitable, the Author has had recourse to the excellent expedient, so far as text-books are concerned, of tabulation and diagrams.

Newcastle Gas Year Book

Praise from U.S.A.

Under the heading "Wanted, a Slogan," the following appeared in a recent issue of *Gas Age-Record*: "All of us in the Gas Industry are aware of the great need for a short, popular slogan which will express the advantages of our fuel and service. Many companies are using 'If it's done with heat, you can do it better with gas,' and this slogan has many good qualities. However, it is not short enough to catch the public fancy in the same manner as 'Say it with Flowers' and other well-known phrases.

"We note with interest two slogans which appear in the 1936 Year Book of the Newcastle and Gateshead Gas Company, England. They are: 'Gas . . . as modern as the hour' and 'Purified coal on tap.' We believe there is romance and modernity in these two slogans."

Athletic and Social

Chester Co-Partnership Dinner.

The co-partners of the Chester United Gas Company dined together at the Bars Hotel on Monday, April 27. Mr. Richard Farmer (Chairman of the Company) presided, and was supported by the Mayor (Mr. T. Davies Jones), Mr. William Cullimore and Mr. Humphrey P. Gamon (Directors), Mr. H. Hopkinson (Secretary), and Mr. J. H. Noble (Engineer).

The Loyal Toast having been duly honoured, the Chairman said he was pleased to meet them all again under such happy auspices. He welcomed the Mayor, who by virtue of his office was one of the Directors of the Company. The Mayor was not one of those who thought that gas was on its last legs. On the contrary, he believed that gas performed a valuable and indeed an indispensable service to that community and to the country as a whole.

Mr. J. H. Noble, proposing "The Company, Chairman, and Directors," said while they were known as a public utility company, they were really a public service undertaking. The last ten years had seen an increase in their sales by 13½%, while the cost to the consumer had been reduced by 7%. During the same period they had added 20% to their length of distributing mains, of which they maintained a hundred miles.

Mr. Humphrey Gamon, responding, said the co-partners were the backbone of the Company. An outstanding feature of the year had been the completion of the new retorts, and that they had been necessary was proved by the fact that the increase in the consumption of gas had gone up by leaps and bounds every week since October.

The Mayor said he was in a somewhat embarrassing position, because in addition to being an *ex-officio* Director of that Company he was Deputy-Chairman of the City Electricity Committee. However, he firmly believed there was room for both concerns to operate, and he believed with Mr. Farmer that the country would be in a very bad state without its gas supply.

"All Co-partners" was proposed by Mr. William Cullimore, who pointed out that while the Directors could do a great deal in encouraging the use of gas in hotels, hospitals, and other large institutions, they of the rank and file could do more among the greater body of consumers, the householders, and much depended upon the courtesy and friendliness they took into the homes of the people.

Mr. T. L. Jones, in reply, said they were all pleased to welcome Mr. Cullimore back among them and to congratulate him upon having been elected Deputy-Chairman of the Company.

Dublin Supper Dance.

Over three hundred guests attended an entertainment in the Alliance and Dublin Consumers' Gas Company's premises at D'olier Street when Mr. W. J. Grey, Secretary, and Mrs. Grey were host and hostess to members of the staff and their friends. Earlier in the month (as announced in the "JOURNAL") Mr. and Mrs. Grey were the recipients of a presentation made to them by members of the staff to commemorate their silver wedding. The company at this week's function, comprising mainly the executive officers of the firm, were first entertained to supper, after which a number of well-known Irish artistes gave an enjoyable programme of vocal and other items in the theatre of the premises. Dancing followed until 3 a.m.

Newport (Mon.) Benefit Society Jubilee Dinner.

The fiftieth annual dinner of the Newport (Mon.) Gas Company's Benefit Society was held at the King's Head Hotel, Newport, on Thursday, April 23, when the toast of "The Town and Trade of Newport" was proposed by Mr. A. E. Jones, Pontypool, and replied to by the Mayor of Newport, Councillor W. Casey.

Mr. J. H. Canning, O.B.E., J.P., Engineer and Manager, who presided, said it was the fiftieth dinner, but actually the Society was more than sixty years old. For several years during the War the dinners were not held.

The toast "The Chairman and Directors of Newport (Mon.) Gas Company" was proposed by Mr. H. D. Madden, Engineer of Cardiff Gas Company, who said there were very many things that Cardiff and Newport had in common. There was a very close alliance between the Directors, Engineers, and Secretaries. Hardly anything was undertaken without consulting one another. "I am one who is not afraid of the future with regard to the Gas Industry," he said. With the development of electricity, with its wonderful power, certain lighting effects and various applications, it was something for which to be grateful. "On the other hand," he said, "we want to take a clear view of the Gas Industry." It was a fuel industry supplying heat in gaseous form and solid form in the shape of coke, tar, and antiseptics, and between the two, at times, there was no comparison. Most engineers without bias could see the two great industries developing side by side.

Responding, Mr. C. O. Lloyd, Director, made reference to the good qualities of the late Alderman Thomas Canning (formerly Engineer and Manager of the Company). "There should not only be co-operation between ourselves and Cardiff," he said, "but there should be—and I am very glad to say there is—most hearty co-operation between not only the Directors, but the whole of the staff. That is one of the things that make for real happiness in work."

Proposing the toast "Newport (Mon.) Gas-Works Benefit Society," Mr. W. Stanford, Secretary of the Company, said that since the foundation of the Society in 1875, £6,901 had been paid out in sickness and funeral benefits. The contribution was only 5d. a week. Response was made by Mr. H. Irvine.

A special toast, to Mr. Canning, was proposed by Mr. Richard Jones.

Watford and St. Albans Sports Dinner.

An event unique in the history of the Watford and St. Albans Gas Company was a sports dinner held in the Clarendon Hall on April 29, which was attended by a company of 350, including Directors, officials, employees, and guests. Mr. Frank H. Jones (Chairman and Managing Director) presided.

"The Watford and St. Albans Gas Company" was proposed by Mr. F. Wilson (Company's Solicitor). It was their own Company, he said, by reason of their personal financial interest in it, and they should be proud of its development.

The Chairman, in reply, referred to the object of the dinner. He spoke of the wisdom of mixing games with work, and went on to thank everyone for doing their part for the Company.

Mr. G. Wilks (Secretary and Commercial Manager of the Company) proposed "The Sports Clubs," remarking that it was a happy idea which had brought the sports together in such a delightful gathering.

Mr. L. J. Kerrison (District Manager, St. Albans) replied.

"The Ladies and Guests" was proposed by Mr. E. T. Warren (Assistant Secretary) in humorous vein.

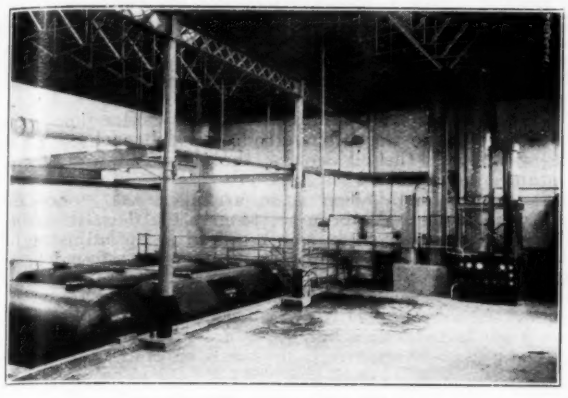
Mr. J. Ramage (Secretary of the Industrial Co-partnership Association) replied.

The health of the Chairman was enthusiastically drunk on the call of Mr. T. C. Battersby (Manager, St. Albans), who thanked Mr. Jones for all he did to make the Company a success.

Entertainment was provided by Violet Stevens (soubrette), Janet Hamilton Smith (soprano), Alec McGill and Gwen Vaughan (the Cheerful Chatterers of the B.B.C.), with Arthur Hutchings at the piano.

New Benzole Recovery Plant Inaugurated at Edinburgh

Edinburgh's new benzole recovery plant erected by Messrs. W. C. Holmes, Ltd., Huddersfield, was inaugurated by the Right Hon. T. M. Cooper, K.C., the Lord Advocate, on May 1. Councillor Walter Muter, Convener of the Edinburgh Corporation Gas Committee, presided.



Distilling Plant and Storage Tanks.

Among those present were the Lord and Lady Provost of Edinburgh, Mr. F. B. Holmes, of Messrs. W. C. Holmes, and Mr. James Jamieson, the Gas Engineer and Manager.

Councillor Muter, in his introductory remarks, described the opening as a very important development. The question of the oil fuel supplies of this country was never more important, and he was happy to relate that the Gas Industry as a whole was playing a notable part in the recovery of benzole.

The Lord Advocate, having turned on the plant, said they had witnessed a noteworthy advance in the work of perfecting the technical equipment of one of the most progressive and successful undertakings in the United Kingdom. The plant would extract two gallons of benzole per ton of coal carbonized, and 200,000 tons of coal were used annually at Granton. From these figures they could form some idea of the magnitude of the enterprise. He congratulated the Corporation on their enterprise, the contractors on the fine plant they had erected, and Scotland, because it seemed to him that this enterprise had more than a local and municipal outlook.

The Lord Provost proposed a vote of thanks to the Lord Advocate for the compliment he had paid them in inaugurating their new plant.

Mr. F. B. Holmes, speaking on behalf on the Contractors, said they had erected many plants in Edinburgh, but that this one would appeal more than any other to the Scottish instinct of making the fullest use of all the products.

Luncheon.

Following the inauguration of the plant, 125 guests were entertained at luncheon by the Edinburgh Corporation Gas Department at the North British Station Hotel.

Mr. D. M. Henshaw, Managing Director of Messrs. W. C. Holmes, said he was greatly honoured to have the privilege of proposing the toast of the "City and Royal Burgh of Edinburgh," with which he wished to couple the name of the Right Hon. the Lord Provost L. S. Gumley. He spoke of the outstanding part played by Scotsmen and the intimate associations which Edinburgh had in the early development of the Gas Industry. He considered that much of the credit for the foundation of the Gas Industry was due to the Earl of Dundonald, who in 1790 carbonized coal, discovered by him in Kinross, and had used the coke produced with great success for the smelting of iron. It was, however, left to William Murdoch, another Scotsman, to be the first to distil coal for the production of gas and to use this gas for lighting purposes. This he did in 1792, and from that time the Gas Industry had developed rapidly. One of the first gas companies was formed in Edinburgh in 1826, Sir Walter Scott being the first Chairman. The shale oil industry founded by Young had also started near to Edinburgh. This was at one time the only source of illuminating oil and wax. They were indebted to Young, Bell, and Beilby for their researches on the production of illuminating gas from shale and for the method of increasing the illuminating power of gas by carburation with oil.

The installation of the plant for the recovery of benzole was another step forward in the history of the Edinburgh Gas Undertaking.

Lord Provost L. S. Gumley, who responded, said that it was often said of Scottish Local Authorities that they did nothing to promote industry. What they were doing to-day furnished a real answer to those critics and would, he hoped, not only benefit the Industry itself but would give that lead to the country which the Secretary of State had called for. The City Corporation had always been ready and willing to assist. Councillor Muter, the Convener, and Mr. Jamieson, the Engineer and Manager, both of whom had displayed very able leadership.

The Lord Advocate, in submitting the toast of "Edinburgh Corporation Gas Department," referred to his earlier professional associations with that Department. The expansion of the Gas Undertaking, he said, had only been equalled in persistence by the steadiness with which the price of gas had been reduced. He paid tribute to the skill and devotion to duty of the technical staff and to the initiative, resource, and breadth of view displayed by the civic heads of the Department concerned with the policy of the Undertaking.

Councillor Muter, in reply, said they were to be congratulated on having such an able Engineer as Mr. Jamieson.

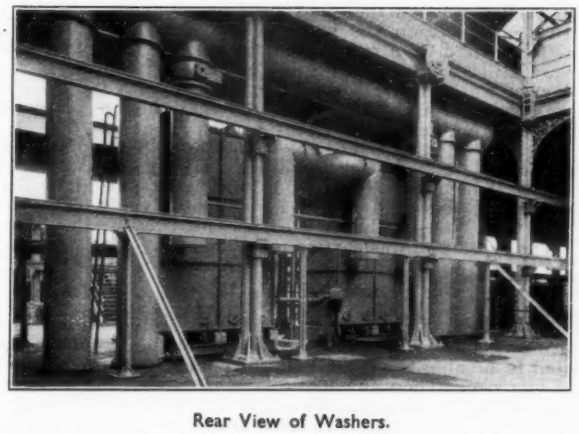
Description of the Plant.

The plant installed at Granton for the recovery of benzole consists of two main parts, the oil washing plant and the oil stripping and benzole recovery plant.

The oil washing plant is situated in the centre of the purifier house and the gas is washed as it leaves the purifiers and before it is metered. This plant consists of two units of Holmes Multifilm brush washers, each unit being 10 ft. by 5 ft. by 15 ft. deep inside. Each washing chamber is provided with a cast iron spray so designed that the spray holes may be cleared at any time from outside the washer without interruption of the spraying action.

Two multiple centrifugal pumps, each with four chambers, are provided, and each washing compartment therefore has its own circulation system, and the amount of washing done in the scrubber can be conveniently controlled.

The gas connections are so arranged that any or all of the four purified gas streams may be passed through the



Rear View of Washers.

washers, the stripped gas passing from the outlet of the washers to the four main inlet pipes to the meters. This arrangement permits of all the gas being partially stripped or any portion being fully stripped, thus giving a valuable control of the quality of benzole produced. The metering system further provides for the stripped and unstripped gas being separately measured, thus giving complete control of the washing process.

The oil stripping plant is situated at the Residual Products Works, some 440 yards distant, and the benzolized oil is conveyed there in a 3 in. pipe. This oil runs by

gravity, there being a fall in level of 21 ft., and a steam driven pump is installed for use at times of maximum make or in the event of the viscosity of the oil rising. It is unusual to find the stripping plant so far distant from the washing plant, but ample covered accommodation was available there for the plant and storage tanks, and no difficulty in operation is anticipated by the arrangement. The plant is also operated by the attendant in charge of the concentrated ammonia liquor plant, no extra labour being required. This arrangement also avoids any danger of fire and keeps the plant away from the gasholders, the only other site available being in close proximity to these.

The oil stripping plant is a self-contained unit and is automatically controlled. It consists of a preheater, still fractionating column and condenser, separators, oil cooler, and heat exchanger, complete with storage tanks, connections, and control instruments, and was designed and erected by Messrs. W. C. Holmes.

The control of the plant has been centralized as far as possible and the instrument panel carries all the valves and gauges for this purpose. An air control regulator is incorporated, complete with motor and compressor, by Messrs. Negretti & Zambra, this control working in conjunction with a distance recording thermometer of the "Mersteel" type. A set of tank gauges is also fitted so that the amount of oil, naphtha, and benzole can be conveniently and accurately gauged at any moment. An oil flow meter by Foxboro indicates the volume of oil passing back to the washing plant.

Three vertical Weir pumps are installed. One pumps the benzolized oil to the still and one the debenzolized oil to the washer via the oil coolers, the third pump acting as a stand-by to either.

The entire installation is so arranged that, once the various controls have been set to give the desired quality of benzole the only alteration required is the adjusting of the rate of oil flow according to the amount of coal being carbonized.

London and Southern District Junior Gas Association

Annual Business Meeting

The Annual General Business Meeting of the London and Southern District Junior Gas Association was held at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C. 1, on Friday, May 1—the PRESIDENT (Mr. J. M. Webber, Croydon) in the Chair.

The minutes of the previous general meeting having been read and confirmed, it was proposed by Mr. J. GRAYSTON (Lea Bridge), seconded by Mr. A. G. SKINNER (East Surrey), and unanimously resolved that Mr. R. W. Latham (Croydon) and Mr. J. P. Hyde (Gas Light and Coke) be appointed scrutineers for the Council ballot.

The HON. TREASURER (Mr. H. G. Soar, Gas Light and Coke) then presented—for the eleventh occasion—the annual statement of accounts, which showed the Association to be in a very sound position financially.

Mr. F. C. SMITH (Gas Light and Coke), in moving the adoption of the financial report, remarked that he thought they would all agree that the finances of the Association were on a very satisfactory footing, a state of affairs which was due in large measure to the work which was done by their Hon. Treasurer. It was no light task to carry on the Treasurership of an Association for eleven years, and he hoped they would continue to have Mr. Soar's services for a long time to come. Their balance-sheet was also satisfactory because their outgoings had been rigorously controlled, though they had not been controlled in such a way as to cramp the work of the Association. Their activities had been run on sound economic lines, and they were still reaping the results, added Mr. Smith, of the pioneer work of Mr. Risby in connection with the price of the Transactions. He considered that they received excellent value for the amount they paid.

Mr. H. C. SIMS (South Metropolitan), in seconding the resolution, agreed that their financial position was very strong, which was due to the hard work put in by Mr. Soar. If they had not such an indefatigable Treasurer they would not be able to show the good results they did.

The resolution was carried unanimously.

The Session's Work.

The PRESIDENT, in presenting his report on the work of the Association during the past session, said that he was glad to be able to report that their membership continued to increase. They now had 6 hon. members, 490 members (including associate members), and 29 student members—making a total of 525. This represented a very satisfactory increase during the year, except in the case of student members, where the number had dropped from 69 last year to the present figure of 29. It must be remembered, however, that student membership terminated at the end of each session, and fresh application had to be made in the autumn. This might account to some extent for the falling off.

They were fortunate in obtaining some very valuable Papers during the session, and it gave him great pleasure to announce that Mr. P. F. Scarth, who was awarded the Milbourne Medal for his Paper on "Sales of Gas and the Basis of Charges" read before this Association last session, had also gained the Silver Medal of the Society of British Gas Industries for his Paper. A novel feature of the session was a General Discussion Evening. He thought it could safely be said that this was a popular innovation, and no doubt the Council would consider a similar evening when arranging the programme for the coming session. They had endeavoured to extend the scope of their visits and to make them rather more varied in interest, and he hoped the members agreed with this policy. Judging from the comments heard, the Council felt that not only were these visits enjoyed, but that members learnt something worth while from each of them. They were deeply indebted to all those who, by reading Papers or allowing them to visit their works, made it possible to carry on the work of the Association.

The President went on to offer most sincere thanks to their Hon. Secretary, Mr. Higton, both on behalf of the Association and himself. In one way it was rather unfortunate that things ran so perfectly under Mr. Higton's guidance that it was difficult to realize the enormous amount of work he did for them. They asked him to do more and more each year, and in some extraordinary way he managed to give the impression that every new job was an added pleasure. It was impossible to overstate their indebtedness to him. Once again their Hon. Treasurer, Mr. Soar, had been a tower of strength, and they were greatly indebted to him for all he had done for the Association.

He also expressed their thanks to the Directors of all the companies who had entertained them and helped them during the session, and particularly to the Directors of the Croydon Gas Company, Mr. Sandeman, the General Manager, and Mr. Grogono, Engineer, for the support they had given him during his year of office.

He was sure they were going to have an excellent session under the Presidency of Mr. Summerson, and the very best wish that he could offer him was that he had the same support and encouragement from the Council and the members that he had had. Mr. Webber was quite sure that he would and that the Association would achieve fresh successes under his Presidency.

Mr. R. N. LEFEVRE (Gas Light and Coke), in proposing the acceptance of the President's report, observed that the success of any year depended upon the leadership of the President, and it had not been lacking during the past session. In reference to the President's remarks in connection with the falling off of student membership, Mr. LeFevre said that many of last year's student members had become associate members this session. He thought that when the evening classes commenced again they would get back to their old numbers once more.

Mr. T. G. NOBLE (Gas Light and Coke) seconded the resolution, which was carried unanimously.

A hearty vote of thanks to the President and Council for their work during the past session was accorded on the proposition of Mr. A. R. COWLISHAW (South Metropolitan), seconded by Mr. F. O. HAWES (Tottenham).

On the proposition of Mr. SOAR, seconded by Mr. H. H. BROWN (Southampton), it was unanimously agreed that a suitable testimonial be presented to Mr. Webber upon his

relinquishing the Presidency of the Association, the proposer remarking that they were proud to have Mr. Webber as their President; one had only to sit with him at their Council meetings to realize what a first-class man he was.

In acknowledgment, the PRESIDENT said that they had paid him such an honour in electing him President that any presentation afterwards really became unnecessary. Nevertheless, he was very grateful to them. He would remember for many years to come the very happy year he had spent as their President.

The PRESIDENT went on to refer to the fact that Mr. G. Gardiner was having to give up the Assistant Hon. Secretaryship of the Association owing to the increasing demands on his time. Mr. Gardiner had always been a good friend of the Association and had served in the capacity of Assistant Hon. Secretary very ably for seven years. The Council felt that they would like to give him a token of their appreciation of his services.

The HON. SECRETARY (Mr. F. H. Higton, East Surrey) referred to the long time he had had the pleasure of working with Mr. Gardiner. He had been a staunch friend of the Association for ten years and a member of the Council for seven years as Assistant Secretary.

Election of Officers and Council.

The following Officers and Council were then elected for the 1936-37 session:

President.—R. Summerson (Luton).
Senior Vice-President.—R. N. LeFevre (Gas Light and Coke).
Junior Vice-President.—S. C. Waldock (Gas Light and Coke).
Hon. Secretary.—F. H. Higton (East Surrey).
Hon. Treasurer.—H. G. Soar (Gas Light and Coke).
Assistant Hon. Secretary.—H. J. Risby (South Metropolitan).
Hon. Auditor.—G. Wilson Smith (Gas Light and Coke).
Council.—H. H. Brown (Southampton), H. W. H. Butterfield (South Suburban), G. Dougill (Gas Light and Coke), J. Grayson (Lea Bridge), F. O. Hawes (Tottenham), H. Moys (Croydon), and P. Richbell (Croydon).

Mr. R. SUMMERSON, in acknowledging his election to Presidency of the Association, said that he was very glad to have this opportunity of saying how very much he appreciated the honour they had done him in asking him to accept this office. He would do his best to carry on the traditions of the Association; but more important than the personality of the President was the activity of the members. The best President in the world could not make an Association function successfully without the support of the members.

Mr. LEFEVRE and Mr. WALDOCK also returned thanks for their respective appointments.

On the proposition of Mr. WALDOCK, seconded by Mr. E. J. WARREN (Wandsworth), a hearty vote of thanks was accorded to the Scrutineers.

It was announced by the PRESIDENT that the following members had been appointed as the Association's representatives on the District Education Committee of The Institution of Gas Engineers:

T. H. Prater (Isle of Thanet).
R. Summerson (Luton).
R. N. LeFevre (Gas Light and Coke).
F. H. Higton (East Surrey).

On the proposition of Mr. F. C. SMITH (Gas Light and Coke), seconded by Mr. P. RICHBELL, it was agreed that a letter be sent to Dr. J. N. Long (Principal of the Westminster Technical Institute), thanking him for his help in connection with the holding of their Council meetings. Dr. Long, remarked Mr. Smith, had always been very interested in the work of their Association.

On the proposition of Mr. BUTTERFIELD, seconded by Mr. SUMMERSON, a hearty vote of thanks was accorded to the Technical Press, which was duly acknowledged by the representatives present.

In the course of further business, various suggestions were put forward by members for Papers and visits for the next session, while some discussion arose in connection with the question of sub-dividing the Association with a view to providing for the different interests of their large membership. After various suggestions had been made and points both for and against the idea ventilated, it was decided, on the proposition of Mr. F. C. SMITH, seconded by Mr. H. J. RISBY, that the Council be asked to view the possibility of splitting the Association into groups, and report at the next annual general meeting.

New "Coalite" Plant for Derbyshire

Low Temperature Carbonisation Project

A record winter's sale of "Coalite" has prompted the Directors of Low Temperature Carbonisation, Ltd., to consider the putting down of additional plant to cope with the steadily increasing demand for their low-temperature solid fuel.

To this end, therefore, the Company have just announced the conclusion of an important agreement with the Bolsover Colliery Company, Ltd., near Chesterfield, for the supply of coal over a lengthy period of years for a large "Coalite" plant which it is proposed to erect adjacent to the Colliery Company's pits at Bolsover. The amount of coal provided for in the present agreement totals over six million tons; but this quantity may be increased considerably at a later date.

The new works will embody low-temperature carbonization plant consisting of 288 retorts in eight batteries of 36, complete with all the necessary ancillary plant, the whole being capable of dealing with more than 180,000 tons per annum. The technical details of the plant will be on similar lines to the Company's other installations at Barugh and Askern, with one or two small improvements consequent upon recent experience.

The Bolsover Colliery Company occupies a prominent place in the mining industry, and the excellent qualities of the Bolsover coal, chief of which is its high volatile content, render it particularly suitable for the "Coalite" process. A contract has been entered into with Imperial Chemical Industries, Ltd., for several million gallons of coal oil suitable for treatment in the hydrogenation plant at Billingham. Large quantities have already been despatched from the Company's other low-temperature installations. Until other outlets are to be found, the gas which is produced in the low-temperature process will be used to heat the retorts; but in the event of an outside market being obtained this will be replaced by ordinary producer firing.

The conclusion of this agreement marks an important advance in the progress of Low Temperature Carbonisation, Ltd., and constitutes another step forward in what has been its declared policy for several years past—namely, the conversion of bituminous coal into petrol, oil, and smokeless fuel. It is hoped that the new plant will be ready for operation by next October, and the works will be administered by a new concern to be named the Derbyshire Coalite Company, Ltd.—a subsidiary of Low Temperature Carbonisation, Ltd.—whose capital will consist of £200,000 in £1 shares, all of which will be subscribed for and owned by the parent Company. The Directors of the new concern will be Col. W. A. Bristow (Chairman and Managing Director), Sir Arthur Hazlerigg, Bart., and Commander Colin Buist, M.V.O., R.N., while the Bolsover Colliery Company, Ltd., have the right to nominate two additional Directors to the Board.

The ever increasing demand for the Company's products will enable the whole of the output of the new works to be marketed without any difficulty, and the utilization of a portion of the cash resources of the Company in this new works should result in a substantial increase in the profits.

Referring to the general progress of the Company, the Directors state that the whole plant of 448 retorts at Barugh and Askern has been kept at full production, as has been the case for several years past, and that "Coalite" has achieved widespread popularity in the domestic market. The Company's coal petrol, which is refined and distributed by Messrs. Carless, Capel, & Leonard, continues to be used by a number of squadrons of the Royal Air Force. In addition, a commencement has been made with supplies to the motoring public, under the name of "Carless-Coalene," which is now on sale at over a hundred filling stations, while orders have been received for supplies to a further two hundred stations. It is stated that the quality of the petrol and its performance characteristics have created a most favourable impression upon experts and public alike, and the Company has been offered additional orders amounting to many times the present output.

The new Diesel oil plant at Barugh—stated to be the first of its kind in the country—was started up on April 20, while two further plants for developing oil and chemical processes are being erected. These will be devoted to entirely new work, which may prove of considerable value.

It is understood that the new arrangement with the Bolsover Colliery Company, Ltd., should have a most beneficial effect upon the future prospects of Low Temperature Carbonisation, Ltd.

New Installation of "Westvertical" Chambers at St. Albans Gas Works

Exterior View of the "Westvertical" Chamber House at St. Albans.

The new installation of "Westvertical" Carbonizing Chambers, the contract for which was placed with West's Gas Improvement Co., Ltd., in November, 1934, is now in full daily operation at the St. Albans Works of the Watford and St. Albans Gas Company. The accompanying photographs give a good general idea of the excellent appearance of the Plant.

The carbonizing chambers, which are 24 in number, are arranged in two lines across the bench and heated from two batteries of three producers placed one at each end of the bench, the fuel gas being carried in a steel main, brick-lined and insulated, running the full length of the bench. These producers are operated under pressure with steam-air injectors of an improved design, and are capable of generating fuel gas from coke breeze.

The whole of the mechanical plant, including the operation of the discharging doors of the carbonizing chambers, is electrically driven.

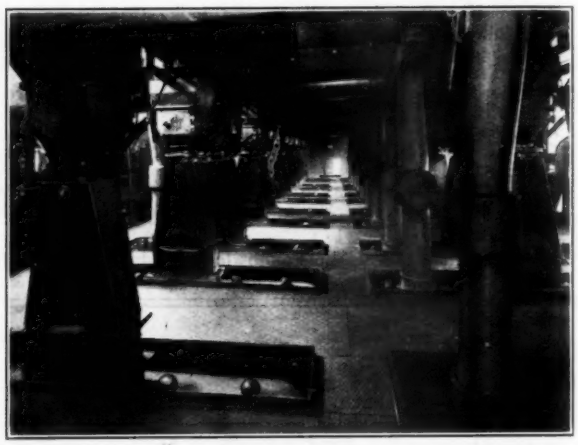
Surplus heat from the bench is recovered in one or two horizontal, fire-tube, induced-draught boilers, which are installed in duplicate, each with an equivalent evaporative capacity of 19,000 lb. of water per hour from and at 100° C. The fans are driven by direct-coupled, totally-enclosed, reciprocating engines and feed-water heaters of the surface type are used to recover the heat of the exhaust steam.

Complete System of Control.

The installation is very completely furnished with instruments for the observation and control of temperature and pressure in all parts of the plant, as well as a complete system of interlocked switches for the control of the electrical gear. Water to the waste-heat boilers and steam to the carbonizing chambers are also measured and fuel to the producers is passed over an automatic weigher and totalizer.

Coke Steam-Cooled in System.

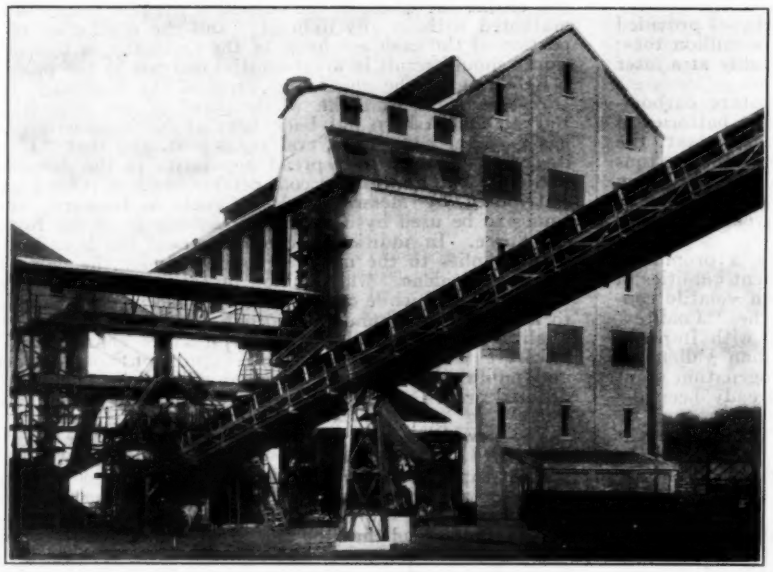
The "Westvertical" system of carbonization is of exceptional interest because it is the first considerable intermittent carbonization plant in which the coke is cooled by steaming within the system. It produces a strong coke of even texture and a yield of gas which is higher even than that obtained in the continuous system. It comprises essentially a vertical carbonizing chamber superimposed upon a coke cooling chamber with an intermediate zone between the two. This intermediate zone is always full of hot coke in which the "steaming" reaction takes place throughout the whole duration of the carbonizing period. Each chamber has a nominal carbonizing capacity of 10 tons per diem.



Charging Stage, Showing Coal Boxes and Gas Offtakes.

The outstanding feature of the "Westvertical" system is the retention of the coke in a specially designed vessel at the base of the carbonizing chamber in which the heat of the residual coke is transferred to the incoming steam. The water gas generated in this process passes upwards to the carbonizing chamber, and greatly assists in the levelling-out of the calorific value of the gas produced throughout the cycle.

The coke as discharged has characteristic properties, being of excellent colour and texture throughout, with great structural strength and low breeze content, so that it lends itself very readily to domestic and industrial purposes, with reduced breakage in handling, grading, and transport. Being discharged dry and cool its moisture content can be readily controlled.

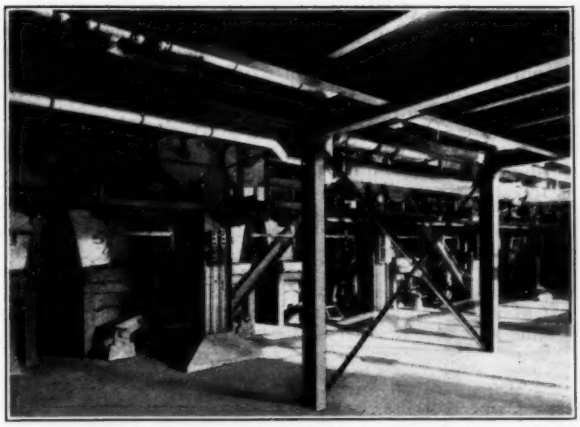


The Coke Plant.

Excellent Results.

The installation has been in continuous operation since Nov. 15, and from Dec. 26 has produced the whole of the gas for the St. Albans district of the Watford and St. Albans Gas Company. The first series of returns are distinctly gratifying as, apart from the high gaseous thermal yield per ton of coal carbonized, the smooth working of the installation permitted the whole of the operations to be carried out by the Gas Company's employees within a month or so of the plant being put into commission.

In the course of the next few months it will be possible to obtain definite figures relating to the results, and it is hoped that, in the near future, Mr. T. C. Battersby, the Engineer, will prepare a Paper in which he will give a full description of the plant, with an account of the advantages and possibilities of this new and intensely interesting process of intermittent carbonization.



Coke Dischargers at Floor Level.

THE MARKETING OF Gas Consuming Appliances

by
J. H. DYDE, M.Sc.,
Sales and Technical Superintendent of the Plymouth and Stonehouse Gas Light and Coke Company.

Continuing from p. 289 of last week's "JOURNAL" the Presidential Address of Mr. J. H. Dyde to members of the Western Junior Gas Association, delivered at a meeting held at Plymouth on Saturday, April 25.

Marketing Policy (*cont.*)

(3) *Hire Purchase and Simple Hire.*

It is perhaps in the consideration of these two systems of marketing that the greatest divergence of opinion exists. The question arises, is there room for both hire-purchase selling and simple hiring, or does one system possess such outstanding advantages over the other as to eliminate it from modern sales practice? In the writer's view each system provides an avenue to the greater use of gas appliances, and each should be exploited in a regulated manner.

It is the writer's view that five years is the desirable limit to which hire purchase terms should be carried, although a number of undertakings are now extending such terms to ten years. Surely a customer is entitled to believe that after the final payment has been made there is something worth having at the end of it, and that subsequently there is a useful period of service to be had out of it without the necessity for expensive renewals. I wonder if some of the advocates of these long term payments have realized the extent of the deterioration to which even high-grade cookers are subject after some years of use where due care has not been exercised.

On the question of simple hire, it cannot be too strongly emphasized that only such appliances that have stood the test of time and experience, and have incorporated in their design facilities for the ready replacement of all wearing parts, should be hired.

The simple hire system, with its low initial cost commitment, forms a valuable spear-head to the introduction of additional and what may be termed non-essential or luxury appliances. It is from such appliances that we expect to increase our load. Here are a few examples in support of this contention—the gas circulator or the multi-point instantaneous heater to supplement the coke boiler for hot water supply, the multi-point heater to replace the single point heater, the sink heater for independent hot water supply to a point, the gas radiator in the hall.

It has been found that where simple hire has been exploited to introduce the appliance, and public confidence in its use has been established, ordinary selling follows as a natural consequence.

(4) *Inclusive Fixing Terms.*

There is no need to stress the undoubted advantage of being able to tell a potential customer that for a certain sum down he can have the appliance ready fixed in his house. The customer at once realizes his commitment, there is no loss of contact while estimates are being prepared, and the salesman has a far better chance of effecting an immediate sale.

Flexibility of the Marketing Policy.

In the effort to secure business, occasions arise which demand individual treatment. To quote one or two simple examples of what is meant by individual treatment, certain Government Departments have been found to be more sympathetic to extending the use of gas if the appliances may be had on hire terms (including maintenance), and much advancement has been made with us locally by the introduction of such terms to a complete range of appliances.

Again, in order to secure the undoubted advantages of having modern equipment in Domestic Science Departments of all schools under the local Education Authority, a gift of a large up-to-date cooker was made to each centre, and other modern cookers and equipment were generally supplied on greatly reduced hire rates, all being rigidly maintained in first-class condition.

Further, consideration is given to large consumers in respect of the replacement of appliances, their fixing, and their maintenance, the extent of any concessions being determined by the value of the client as a gas consumer and the possibility of augmenting his load.

District Contact with the Consumer.

It is now fourteen years since the inception of our district canvassing scheme. Originally three men of pleasing personality and good address, and with a definite inclination towards salesmanship, were picked out from the fittings staff, were placed under a salesman who had received both showroom and district experience, and were given the job of house-to-house visiting of quarterly consumers. Around this nucleus has been built our existing extramural sales activity. The canvassers' duties on entering a house are to examine all gas fittings and equipment from the meter to the points of combustion and to test all burners.

The Gas Industry is still unprotected against the marketing of cheap and shoddy appliances in which the combustion characteristics constitute a real source of danger to the users. Further, in spite of our efforts and the efforts of appliance manufactuers to educate local plumbers and builders into the correct fitting of gas appliances, cases are still encountered where the installation work renders the appliance ineffective or unsafe in use. Price cutting is more often responsible for inadequately sized supply pipes and

ineffective flues than is the lack of knowledge of the correct and proper manner of carrying out the work. Where faulty installations are found on the district the consumers are informed of the matter in writing and an offer is made to rectify the installation at net cost, an estimate being submitted if required.

With regard to builders in the matter of new property, our "Carcassing Bonus Agreement" has done much towards eliminating faulty installation work and has helped us to establish a closer co-operation with them.

Under this scheme, all builders carcassing to our specifications receive a bonus of five shillings in respect of every gas point provided in a house, after an inspector has examined and tested the whole system for gas tightness and certified it as correct.

It may be of interest to record the growth of this subsidy scheme among our local builders:

Year.	Number of Builders Participating.	Amount Paid Out.
1933	34	£186
1934	67	£397
1935	85	£491

Increased business and the development of district maintenance has had the effect of making us short of good qualified fitters, and advertisements in the Technical Press have not brought forward young men with the qualifications we desire, even on the promise of permanent employment. Our own Fitter Training Scheme will in a year or two relieve the situation, but for the moment we are hard pressed to keep pace with orders.

The undoubted success of the canvassing scheme among the quarterly consumers has led us to extend its application to embrace our 27,000 prepayment consumers. Two years ago we started with two more canvassers to work these consumers, and last year we took on two more. These men had previously obtained canvassing experience when transferred from the fittings department during the summer months. The census of the prepayment consumers is now complete, and from April 1 of this year the eight permanent men will work among quarterly and prepayment consumers alike without discrimination when combing a particular district. Even now, with the staff additions that have been made, each canvasser has to deal with 5,730, and this represents a field of activity quite large enough for one man to tackle. The additional summer canvassers lend flexibility to the system and make it possible to release one of the permanent men to concentrate particularly on new building work.

Use of a Mobile Showroom.

Through the courtesy of the Gas Light and Coke Company we were able to obtain much useful information as to the construction and activity of their own fleet of travelling showrooms, and it was decided that a vehicle of this type would be an acquisition of considerable value to our sales department, particularly having regard to the scattered area over which we now distribute gas.

A single-decker omnibus which was due to be replaced was purchased from a local transport company.

The following figures show the details of the operating costs of the first year's running, which was completed in February of this year:

	£	s.	d.
Fuel	42	6	4
Oil	3	3	3
New parts	11	5	8
Licence	70	0	0
Insurance	8	0	0
Labour (repairs)	6	17	6
Wages of mechanic driver	171	8	1
	£313	0	10
Mileage	5,394		
Cost per mile	13·9d.		

The vehicle was particularly useful in a recent canvass of a rural area, where a preliminary survey had suggested the desirability of extending a gas supply.

Our statistics reveal that an average of 23 people per day pass through the vehicle. The actual sales taken and appliances hired at the vehicle for the past twelve months are summarized as follows:

—	Sold.	Hired.
Gas cookers	34	94
Gas water heaters	11	28
Gas wash-boilers	29	..
Gas fires	67	..
Gas sundries (irons, poker burners, boiling burners, &c.)	71	..
	212	112

On the face of it this may be considered very poor business, but the true value of the vehicle is very difficult to assess and is certainly far in excess of the handful of direct sales shown. In addition to the advertising value, the large number of people who, when purchasing at the showrooms, make reference to the vehicle gives some idea of the indirect results being obtained from its use.

Window Display.

In relation to the size of our showrooms we are singularly well equipped with window display space, having one large centre window and two moderate sized side windows.

All three windows are of the closed type, the showrooms being reconstructed from two separate shop premises and not lending themselves readily to an open and pleasing view into the interior. The inability to throw open the window for general display is not, however, considered a disadvantage.

The writer has had the opportunity within the last few months of inspecting three of the newest gas showrooms, and in each case the open type of window has been favoured. The general impression from the street, particularly at night with the interior brightly illuminated and with the decorative settings in their pristine freshness, is extraordinarily pleasing, but the criticism is offered that while the eye takes in the collective scene it focuses on nothing. Further, it is difficult with open windows to present that element of change, week by week, and the regular passers-by fail to be attracted by the prominence of any individual selling line. As a selling agent the window loses much of its value unless it can exert an instant and localized attraction; and it is for this reason that the writer favours the closed window and the unit type of display.

Exhibitions.

There is also the rather spectacular method of arousing interest by a special display effort, to which the public are invited. An exhibition may be organized by the undertaking for the sole purpose of demonstrating gas and coke consuming appliances, or it may be organized by an outside party to include a variety of exhibitors, of which the gas undertaking is one. In the former case the exhibition has a limited appeal to such persons whose interests have already been aroused by the result of general gas advertising and propaganda, while in the latter case the appeal is more general, embracing people who attend without any objective desire to view gas apparatus. The value of the open exhibition lies in the contacting of people who would normally have too little interest to be attracted by display devoted entirely to gas apparatus.

It has been our unfortunate experience in the past to participate in several local open exhibitions which have been so badly organized, and so poorly supported by local traders, as to be nothing short of a fiasco.

It is largely owing to the failure of these enterprises that we have in recent years concentrated our efforts in the staging of our own exhibitions.

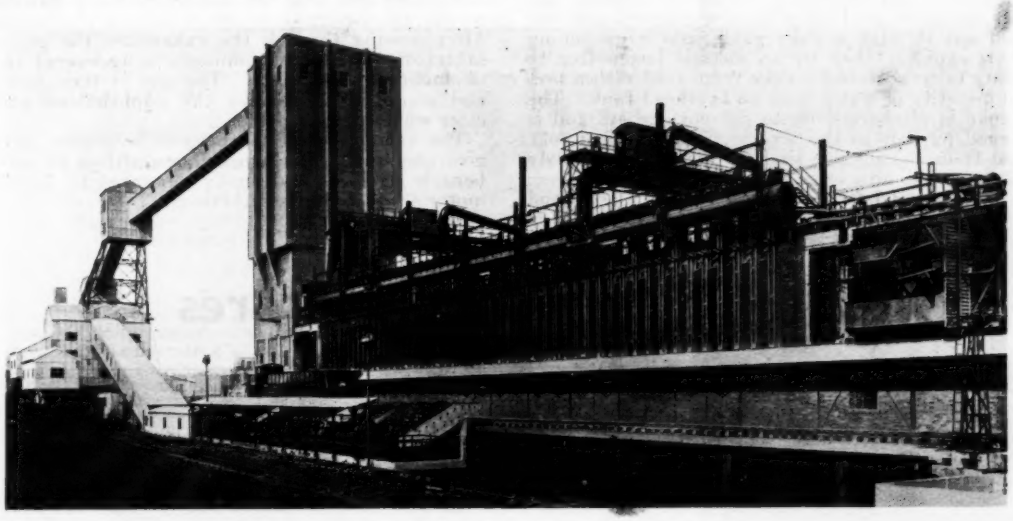
Originally we used to hold exhibitions over a period of one week, but on the last two occasions when we have launched out in a more ambitious manner with increased expenditure we have found it well worth while to extend the exhibition to a fortnight. The second week of last year's exhibition was highly productive of direct sales, and all previous records for orders taken during an exhibition period were broken by a considerable margin.

The following data concerning our exhibition last year may be of interest. It was held over a period of a fortnight (12 useful days) at a hall in the centre of the town where all traffic converges. Nearly 5,000 people attended and the whole effort cost the Company £498, the expenses being distributed thus:

	%
Publicity—Press, posters programmes	25
Materials—Display stands, stage, and decorations	23
Labour—Carpenters, fitters, decorators, transport handymen	27
Hire of hall—14 days	9
Special lecturers' fees	6
Catering	5
Sundries—Musical entertainment, gratuities, &c.	5
	100

In conclusion, I should like to express my thanks to our Managing Director, Col. R. L. Norrington, C.M.G., for his permission to record the matter set out in this Address, and for the help and guidance he has given me at all times; also I would like to acknowledge with thanks the helpful advice and criticism accorded to me by the Company's Secretary and Director, Mr. G. H. Bolton.

OFFICIAL INAUGURATION OF



View of the oven batteries from the coke side, showing the coal and coke handling plants, with the 2,000-ton coal service bunker on the left.

Glasgow's New Coking Plant

Messrs. William Dixon's new £250,000 by product coking installation erected by Simon-Carves, Ltd., at Govan Iron-works, was officially opened by the Rt. Hon. the Lord Provost of Glasgow, Mr. John Stewart, on April 27.

The plant will use daily 925 tons of wet coal for the production of 500 tons of furnace coke, about 100 tons of small coke, 10 million cu.ft. of rich gas, together with benzole, oil, and ammonia.

Dr. Robert T. Moore (Chairman of the Company), who presided at the inauguration ceremony, said the early Dixons had done much to bring prosperity to Glasgow. This tradition was now being continued by the present enterprise, which would enable them to produce first-class pig-iron at a lower cost and so give a still greater impetus to ship-building on the Clyde.

The Lord Provost congratulated Messrs. William Dixon on their enterprise and wished every success to the project, which would utilize coal to the best scientific advantage. He hoped that the gas now being wasted would soon find a market.

Sir Adam Nimmo, on behalf of the Scottish coal industry, also expressed the hope that this venture would meet with great success.

Description of the Plant.

Foundations.—Considerable difficulty was experienced in obtaining a safe foundation for the plant, and 573 piles, 30 ft. long and 17 in. diameter, covered with a reinforced concrete raft 2 ft. 6 in. thick, were used.

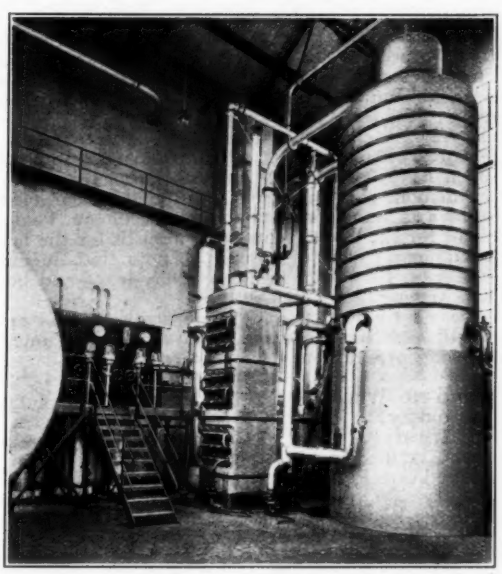
Coal Handling.—The coal-handling plant has a capacity of 120 tons per hour. The wagons of coal are tipped into an underground hopper and from there the coal is taken by a belt conveyor to the Carr crushers and then elevated to the reinforced concrete service bunker. This bunker has a capacity of 2,000 tons of crushed coal in one compartment, 45 ft. wide by 43 ft. long and 140 ft. from the ground level to the top. The bottom of the bunker is hoppered and provided with three rows of openings (four in each row) to discharge into the charging car.

A 50,000 gallons water service tank is situated on the bunker roof.

When the coking plant is eventually duplicated the coal-handling plant will be sufficient for the increased coal requirements, but will work 16 hours per day instead of 8 as at present.

The Coke Ovens.—There are two batteries of 25 ovens each. Each oven is 38 ft. long, 17¾ in. wide, and 12 ft. 6 in. high, and takes a wet coal charge of 13·9 tons, the normal coking period being 18 hours. The ovens are of the Simon-Carves "Underjet" twin-flue compound type and may be heated by the rich coke oven gas produced or by low-grade blast-furnace gas, or both these gases may be used at the same time, any number of ovens being fired by either gas. When using lean gas, the gas as well as the air is preheated by passing through the regenerators. Reversals of the gas and air are carried out by a fully automatic reversing winch located in the control room along with the various instruments for recording temperatures and pressures, &c., on the battery.

The oven doors are of the "Wolff" self-sealing type, with metal-to-metal machined joints, and are perfectly gas-tight.



View inside benzole house, showing crude benzole plant and control board.

Coal Charging.—The plant being in the city of Glasgow, special arrangements have been made for the elimination of smoke during the charging of the coal. The coal is charged by an electrically-operated charging car into the oven chamber through four openings and the charge

levelled by a leveller bar, which is part of the pusher machine. The latter machine also removes the doors on the ram side of the oven.

Coke Quenching and Screening.—After the charge has been coked, the doors on both sides are removed and the coke pushed out through a coke guide into a quenching car, which is rapidly taken by an electric locomotive to the quenching tower. Here the coke is sprayed with a predetermined quantity of water from an overhead tank. The quenched coke is discharged on to the coke wharf and is later conveyed by belt to the screens. The furnace coke is separated from the smaller sizes by means of a grizzly screen and is loaded into wagons from a boom conveyor. The small coke is separated into three domestic sizes and breeze by a vibrating screen and is delivered to four concrete storage bins.

By-Product Plant.—The gas is cooled by passing through condensers and then the suspended tarry particles are removed by means of a Simon-Carves electrostatic plant. After passing through the exhausters the gas enters the saturators, where the ammonia is recovered in the form of ammonium sulphate. The gas is then further cooled and scrubbed to remove the naphthalene and benzole, after which it is ready for use.

The rich oil from the benzole scrubbers is distilled to give once-run crude benzole, re-distilled to give once-run benzole rectified, and finally separated by distillation into motor spirit and other fractions.

Gas Propaganda in the Big Stores

For the eighth successive year the Newcastle-upon-Tyne and Gateshead Gas Company are holding a series of displays and demonstrations at the large and enterprising establishment of Messrs. Fenwick, Ltd., Northumberland Street, Newcastle.

Another Successful Effort at Newcastle

For the first year or two the duration of these displays and demonstrations was for one week, but so popular were they with the public that they are now carried on for a period of two weeks. In recent years a floor space of 3,000 sq.ft. has been allotted to the Company in what is known as the Exhibition Hall of the establishment, where special mannequin parades, &c., are usually held.

Each year an endeavour is made to give changes and new features. Model rooms, ideal kitchens, competitions, and so on have been carried out with cookery and home laundry demonstrations, and it is usual to incorporate in the displays as many items as possible of Messrs. Fenwick's equipment for the model rooms and utensils for the labour-saving kitchens. It is of interest to note that during the period Messrs. Fenwick's sales go up by leaps and bounds in their kitchenette department.

This year's Exhibition and Demonstrations was opened by Stanelli and Norman Long, of broadcasting fame, and the following programme is being carried out:

AROUND-THE-WORLD IN COOKERY.
SANE SLIMMING.
MODEL KITCHEN DESIGNS.
PERFECT FOOD PROTECTION.
NOVELTY CAKE ICING.
EASY WASH WAYS.
WORK SAVING IDEAS.
DISPLAYS.

Around-the-World in Cookery includes demonstrations of: "Five Minutes Cookery from the States," "Dishes from a Swedish Table," "Cooking with the German Housewife," "Dine in France," "Italian Savouries," "Hints from Our Australian Cousins," "Typical Indian Dishes," "A Housewife's Flight to the Cape," "Suggestions from Sunny Spain," and "A Page from a Danish Recipe Book."

Sane Slimming.—Balanced Diets for Perfect Health. Miss Elsie Morrison (Cordon Bleu), the Company's Senior Lady Demonstrator, explains the secret of healthful catering to preserve the slim silhouette of to-day.

Specimen Diets bearing on "What to Eat—and Why," showing their various food values, are being displayed daily in glass cabinets. These Demonstrations attract unusual interest among the ladies and are given under the following headings: "Fashion Decrees Slim Figures," "Dieting in a Healthy Way," "Catering for the Too-Slim," "An Ideal Reducing Diet," "Cooking for the Convalescent," "Essential Foods for Growing Children," and "Health Cookery for the Anæmic Child."

The Demonstrations in cookery during the fortnight are held each afternoon in two sessions and one session each morning.

A photographic display of the latest model gas kitchens planned to save time and labour is staged and invitations offered to visitors by the Company to submit plans, colour schemes, and give helpful advice on the modernizing of customer's own kitchens—entirely free.

Other demonstrations include "Easy Wash Ways," "Cold Cookery," and refrigerator displays.

Messrs. Fenwick advertise the event in the Press, on the trams, and throughout their own establishment and windows. The Gas Company, on their part, issue some 15,000 invitation folders and also announce the event in the Press, erect the displays, and, of course, carry out the fixing of the gas appliances.

Messrs. Fenwick are entirely satisfied with the attendances at the demonstrations and the general increased turnover in their various Departments. Last year over 10,000 persons visited the displays, and it is estimated that this number will be exceeded this year.

The Gas Company find such exhibitions in the big stores of excellent publicity value, and good orders and enquiries are secured. A feature that must not be overlooked is the fact that, although such demonstrations and displays could be carried out in the gas showrooms, there is an entirely different atmosphere away from "Gas" in getting such propaganda over in an enterprising store.

One of the attractive series of appliance displays staged by the Newcastle Company in connection with the demonstrations is shown in the photograph reproduced above.

Institution of Gas Engineers' Examinations

The following questions were set for the Examinations in Gas Engineering and Gas Supply, which were held on April 25 and May 2 respectively.

GAS ENGINEERING.

ORDINARY GRADE.

2 p.m. to 5 p.m.

(Two questions only in each of the three Groups should be attempted.)

GROUP A.

1. Sketch a cross-section of the producer and combustion chamber of a retort setting. State (*a*) the chemical reactions which take place in each and (*b*) your opinion of the best working temperature of the combustion chamber, giving brief reasons.
2. Describe methods of (*a*) taking a sample of waste gas from the main flue of a retort bench and (*b*) analyzing such sample. Give your idea of what its composition should be.
3. Specify in their order of operation the various units of plant required in connection with the manufacture and purification of coal gas. State briefly the function of each and the reasons for the order given.

GROUP B.

4. State what are the impurities which it is essential to remove from, and to what extent they are found in, crude coal gas on leaving the exhausters, after passing through the condensers. Explain how the ammonia is removed, and describe a test to ascertain the quantity of ammonia in crude coal gas.
5. Describe the process of dry purification of gas when using oxide of iron to eliminate sulphuretted hydrogen, and state the chemical reactions which occur. Sketch a cross-section of a purifier, showing the means employed (*a*) to carry the oxide of iron and (*b*) to make the cover gas-tight.
6. Sketch the apparatus used and describe in detail the test to ascertain the quantity of sulphur compounds other than sulphuretted hydrogen in coal gas. State the average amount of these compounds in grains of sulphur per 100 cu.ft. of purified town gas, having regard to the type of carbonizing plant employed and the coal used.

GROUP C.

7. Briefly describe, with the aid of sketches, how the moving parts of a telescopic gasholder are sealed and guided. If a 12 in. water pressure is required from a gasholder 200 ft. in diameter when fully inflated, what would have to be the total weight of the floating portion?
8. What is the function of a station meter? Sketch a wet type of meter and describe its action. How is the water level indicated and how is it maintained?
9. Describe the operation of a portable pressure recorder and illustrate by sketches its construction. Explain what is meant by the terms "pounds per square inch" and "inches water pressure."

HIGHER GRADE.

PART I., 2 p.m. to 5 p.m.

(Two questions only in each of the two Groups should be attempted.)

GROUP A.

1. (*a*) Describe a method of evaluating gas oil for gas making purposes.
   (*b*) Describe a complete cycle of operations on a hand-operated carburetted water gas plant with back run, giving approximate time schedule.
   (*c*) State what changes would probably be required in the time schedule when changing from light to heavy carburetting.
2. (*a*) When the length of the carbonizing period in a horizontal retort bench is changed from 12 to 18 hours to meet a reduced seasonal demand, what adjustments, if any, would you make to the primary and secondary air and waste gas controls?
   (*b*) What changes, if any, would result in the yield and composition of gas, tar, and coke respectively?
3. (*a*) What proportion of the heat produced in a retort bench is lost by radiation from the bench itself?
   (*b*) Describe any precautions which may be taken in the design of the bench to minimize this loss.

GROUP B.

4. (*a*) State the general effects of temperature upon the process of dry purification with oxide of iron.
   (*b*) Calculate the acidity of the purifying material, in terms of percentage by weight of sulphuric acid, from the following data:

Weight of material taken	= 25·00 grammes
Volume of N/5 sodium hydroxide required for neutralization	= 8·50 millilitres

(S = 32; O = 16; Na = 23; H = 1)

5. (*a*) Compare the yield and the characteristics of the tars obtained from the carbonization of coal in horizontal and vertical retorts respectively.
   (*b*) Describe the construction and operation of a dehydrating plant for making road tar.
6. (*a*) Describe, with the aid of a diagrammatic sketch, the construction and operation of a gas-drying plant.
   (*b*) Describe a suitable hygrometer for determining the dew point of gas and state the practical considerations which should determine the dew point at the outlet of the drying plant.

HIGHER GRADE.

PART II., 6 p.m. to 9 p.m.

(Two questions only in each of the two Groups should be attempted.)

GROUP A.

1. (*a*) Explain what is meant by "hardness" in boiler feed water; in what way may it become a source of trouble?
   (*b*) Describe the construction and operation of a water-softening plant.
2. Assuming that it becomes necessary to cease gas making for a short period to enable a length of works main to be renewed, describe the procedure you would adopt and the precautions you would take when closing down and re-starting gas making.
3. Describe the construction and operation of an approved type of recording calorimeter.

GROUP B.

4. (*a*) Enumerate and describe the essential properties of the various component materials used in constructing a mass concrete foundation for a static load.
   (*b*) State the proportion of each component and the precautions to be taken in preparing and placing the mixture.
   (*c*) State the load per square foot which could be borne safely by a stiff clay subsoil.
5. (*a*) Describe a method of constructing the bottom of a steel storage tank which admits of its being tested for tightness after assembling.
   (*b*) Sketch a double rivetted lap joint for two half-inch steel plates, giving approximate dimensions to ensure equal strength of rivets and plates.
6. (*a*) A gas engine uses 20 cu.ft. of 480 B.Th.U. gas per horse-power-hour. What is its thermal efficiency?
   (*b*) Describe, with the aid of a sketch of a typical indicator diagram, what takes place during a complete cycle of operations in the engine cylinder.

DIPLOMA EXAMINATION IN GAS ENGINEERING (Manufacture).

PART I., 2 p.m. to 5 p.m.

(Four questions only should be attempted.)

1. (*a*) It is required to lay out new carbonizing installations—
   (i.) to produce 50,000 therms per day.
   (ii.) to produce 2,000 therms per day.
   State the calorific value you would adopt and give reasons.
   (*b*) Describe, with outline sketches, your lay-out of one of these installations from the coal supply alongside, to the exit main from the installation, giving briefly your reasons for preferring the type and individual features of the plant described.
2. (*a*) Discuss the theory and object of condensation and describe briefly the functions of the various types of plant used for its ultimate attainment, including the removal of tar fog.
   (*b*) State the principles of the design of any one type of condensation plant—*i.e.*, apparatus installed between the carbonizing and wet purification plants.
3. (*a*) What effect has the introduction of waste-heat boilers had on works power production and use?
   (*b*) To what features do you attribute the relatively high thermal efficiency of such boilers and what are the accompanying disadvantages, if any?
   (*c*) What factors limit the overall efficiency of waste-heat boilers?
   (*d*) State what type of drive you would adopt for an induced draught fan on a waste-heat boiler, and give reasons for your choice.
4. Compare the working principles and relative merits of the wet, dry (positive), and electrical types of station meters, and state how continuity of accurate registration is ensured.
5. Discuss any two of the following:
   (*a*) The economics of low-temperature as compared with high-temperature carbonization processes.

(*b*) Coke cutting and the effect of sizing and grading on the utilization and sales of coke.
(*c*) The function of carburetted water gas in modern gas practice.
(*d*) The fouling of gas in holders.
(*e*) Calor gas.

PART II., 6 p.m. to 9 p.m.

(*Four questions only should be attempted.*)

1. (*a*) Compare the general effects of the amalgamation of adjacent gas undertakings and of their acquisition by a holding company.
(*b*) In the amalgamation of a large with a small gas undertaking what are the principal factors determining the differential selling prices which shall ultimately obtain?
2. Describe how you would determine for a gas engine (*a*) the heat supplied, (*b*) the work done, (*c*) the heat carried away by the water jacket, and (*d*) the heat carried away by the exhaust gases.
Draw up a heat balance-sheet showing the results you would expect to obtain with a modern type of gas engine of, say, 80 b.h.p.
3. (*a*) Using the formula $P = \frac{V^2}{200}$ where P = pressure of wind in pounds per square foot, and V = velocity of wind in miles per hour, find the total maximum wind pressure on a gasholder 150 ft. in diameter and 100 ft. high during a hurricane when the velocity of the wind is 100 miles per hour.
(*b*) Using a factor of safety of 4 calculate the thickness of steel plate of 30 tons per sq.in. ultimate strength necessary for a spherical high-pressure gasholder 50 ft. in diameter for gas at 50 lb. per sq.in. (gauge pressure).
4. (*a*) Describe the rotational method of working purifiers which you prefer, giving reasons for your preference.
(*b*) Give in detail the operations for the efficient and safe shutting off, discharging, re-charging, and putting to work of a purifier.
(*c*) State points to be observed in testing new purifying materials and in preparing partially spent material for re-use.
5. Give a brief account of the chief developments in gas engineering practice, described recently in technical literature.

GAS SUPPLY.

ORDINARY GRADE.

2 p.m. to 5 p.m.

(*Two questions only in each of the three Groups should be attempted.*)

GROUP A.

1. Assume a gas main of a given length and diameter and laid horizontally passes 10,000 cu.ft. of gas per hour with a pressure difference of 2 in. water gauge. What would be the pressure difference if the discharge end of the main was 150 ft. higher than the inlet end and the flow of gas increased to 15,000 cu.ft. per hour?
The specific gravity of the gas is to be taken as 0·47 (air = 1·00).
2. Sketch and describe:
(*a*) A constant pressure governor.
(*b*) A constant volume governor.
In what circumstances would you recommend the use of these different types of governor, and in what position would you fit them?
3. What precautions would you take in fixing an instantaneous water heater in the bathroom, 10 ft. × 6 ft. × 8 ft., of a bottom flat of a four-storey building?

GROUP B.

4. State three distinct ways of producing hot water by means of gas and explain the circumstances which favour each of them.
5. Compare the cost of heating 50 gallons of water through 100° F. by gas at 9d. per therm and by electricity at 0·75d. per unit.
State the types of apparatus you, in making these calculations, have assumed would be used, and discuss, from a technical point of view, the relative merits of gas and electricity for this particular application.
6. State the conditions that influence the design of a gas cooker and explain how they are met in practice.

GROUP C.

7. What are the advantages and disadvantages of gas and electricity for (*a*) domestic and (*b*) street lighting?
8. What is meant by "annealing"? Sketch and describe a furnace for annealing operations, stating gas consumption and temperatures attainable.
9. What do you understand by the gross calorific value and the net calorific value of gas? To what is the difference due? Which value would you use in determining the efficiency of a gas appliance?

HIGHER GRADE.

PART I., 2 p.m. to 5 p.m.

(*Two questions only in Group A and three questions only in Group B should be attempted.*)

GROUP A.

1. (*a*) Tabulate methods adopted for measuring the quantity of gas flowing through a pipe, and state their respective advantages, disadvantages, and particular uses.
(*b*) Sketch and describe any one such measuring instrument.
2. How are services connected to steel mains? Give sketches showing the finished joint. What tools would you employ?
3. A gas undertaking proposes to increase the calorific value of its gas from 450 to 500 B.Th.U. Give, in answering the following questions (*a*), (*b*), (*c*) and (*d*), your reasoned views regarding this proposal:
(*a*) What would be the percentage change in the storage capacity of the gasholders expressed in therms?
(*b*) What would be the probable percentage change in the carrying capacity of the mains expressed in therms?
(*c*) What alteration would have to be made in the appliances?
(*d*) Would you advise that the increase in calorific value be made in one or more stages? Give your reasons.

GROUP B.

4. What is meant by the CO/CO_2 ratio as applied to products of combustion and how would you determine it? Give the acceptable values of this ratio for (*a*) a gas fire, (*b*) a heater having luminous flames, and (*c*) an incandescent burner.
5. Sketch and describe (*a*) a semi-catalytic gas fire igniter and (*b*) a semi-catalytic lighting burner igniter. What are your views regarding these devices?
6. State the main systems of gas application to furnaces and other industrial appliances. Under what conditions is each justified?
7. Sketch and describe (*a*) an air temperature controller and (*b*) a safety thermal cut-out. What are their advantages and limitations?

HIGHER GRADE.

PART II., 6 p.m. to 9 p.m.

(*Two questions only in Group A and three questions only in Group B should be attempted.*)

GROUP A.

1. The diagram (fig. 1) represents the U-gauge pressures along a trunk main between two points A and B, 20,000 yards apart. Calculate the height above datum of the main at points 10,000 and 15,000 yards from A on the assumptions:
(*a*) that gas is flowing from A to B.
(*b*) that at both A and B the main is 100 ft. above datum.
(*c*) that the gas has a specific gravity of 0·55.
(*d*) that no gas leaves the main between A and B.

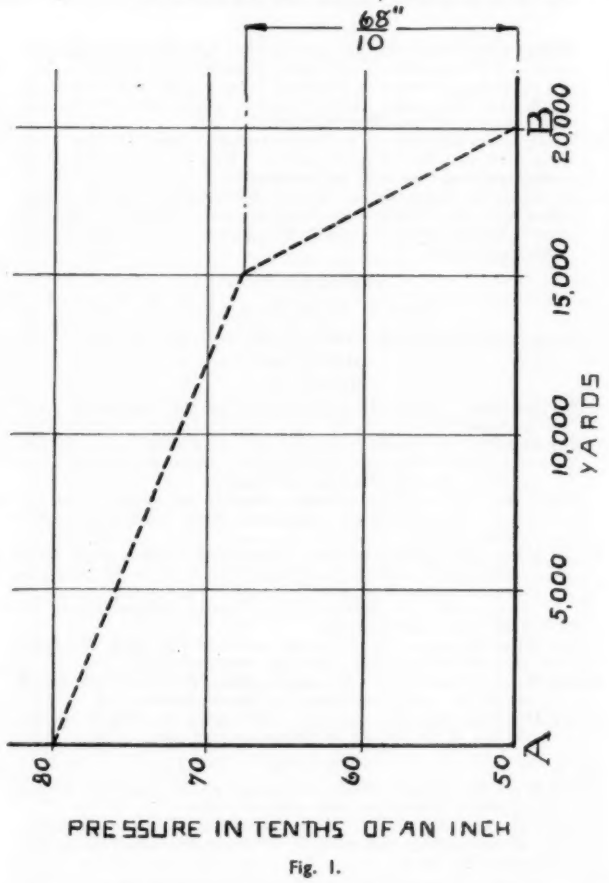


Fig. 1.

2. A gas-fired central heating boiler is to be used for heating two large rooms, one of which has to be maintained at 55° F. and the other 65° F. In both rooms the stated

temperatures must be assured between the hours of 9 a.m. and 5 p.m.

What automatic controls are available which ensure the required conditions being secured with the utmost economy? Describe one form of control.

3. (*a*) What is meant by (i.) temporary hardness and (ii.) permanent hardness of water? Explain their significance and their relation to the design and operation of gas appliances for central heating, hot water supply, and steam generation respectively.

(*b*) What methods are available for avoiding difficulty arising from hard water?

GROUP B.

4. A convenient method of expressing the comparative values of gas and electricity is by stating the number of kilowatt-hours required to do the work of one therm of gas (units per therm). What values would you give for (*a*) space heating, (*b*) water heating? Give the thermal efficiencies of the appliances chosen for your comparison and work out one case from basic principles.

5. (*a*) Describe with sketches the operation of the large type air-cooled refrigerating unit.

(*b*) What would be the probable causes of complaints from users of these gas-operated refrigerators and how would you remedy them?

6. A plating vat 10 ft. long by 3 ft. wide is filled to a depth of 2 ft. 6 in. with a liquid of specific gravity 1·5 and specific heat 0·9.

Assuming that steam were applied at 5 lb. per sq.in. pressure from a gas-fired steam boiler with thermal efficiency of 70%, how much gas and how many pounds of steam would be required to raise the temperature of the liquid from 90° F. to 130° F.

Assume no losses from steam pipes or vat by convection or radiation.

Latent heat of steam at 5 lb. per sq.in. = 956 B.Th.U. per lb.

Calorific value of gas used = 500 B.Th.U. per cu.ft.

7. Compare the merits of gas water-heaters of the instantaneous multipoint type and the lagged storage type.

What conditions favour one type in preference to the other?

Which type would you recommend for a sports pavilion?

DIPLOMA EXAMINATION IN GAS ENGINEERING (Supply).

PART I., 2 p.m. to 5 p.m.

(*Three questions only should be attempted.*)

1. Sketch and describe any type of unit air heater with which you are familiar.
2. Discuss the effect of "load factor" from technical and economic aspects, both in regard to distribution and to utilization.
3. Draw up specifications for (*a*) a gas fire and (*b*) a thermostatically controlled gas cooker.
4. What is meant by "atmosphere control"?

Describe a furnace equipped with atmosphere control for high speed steel treatment, giving the scientific principles of working.

PART II., 6 p.m. to 9 p.m.

(*Three questions only should be attempted.*)

1. Give a detailed statement of the factors affecting the combustion efficiency and thermal efficiency of an instantaneous water heater. Describe recent developments in the design of such a heater and give descriptive sketches of two forms of dissimilar automatic gas and water valves, stating the advantages and disadvantages of each form.
2. State what is meant by:
   (*a*) Rated illumination,
   (*b*) Service illumination,
   (*c*) Spacing height ratio,
   (*d*) Unit of system,
   (*e*) Isocandle diagram,

   as applied to the British Standard Specification for Street Lighting.

   Describe a method (with formulæ) of determining the mean lower hemispherical candle power of a gas lamp.
3. Fully describe, with detailed sketch, the method of automatically controlling the district pressure by means of a remote controller. In what circumstances would you recommend such a form of control?

   State what you know of its limitations.
4. The practice of distributing heat for industrial processes by means of hot circulating fluids is becoming more common.

   Discuss the advantages and limitations of the following fluids as heat distributing media, and in each case describe its application to one industrial process (not central heating) for which it is suited:
   (*a*) Steam.
   (*b*) Oil.
   (*c*) Air.
   (*d*) High pressure hot water.

For High-pressure Gas Mains

THE Stanton-Wilson Self-adjusting Pipe-joint enables gas mains to withstand ground subsidence and traffic vibration. Being leaktight under pressure, it is particularly suitable for mains in gas supply systems. Well over 300,000 Stanton-Wilson Joints are now actually in service.

Stanton-Wilson Joints are available with Stanton "New" Spun Iron Pipes in diameters ranging from 3 inches to 15 inches.

These pipes are centrifugally cast without chill by a patented process which increases their impact resistance to beyond anything obtainable with the thicker sand-cast pipe. Gas cannot percolate through the dense, non-porous structure of the "New" spun metal.

STANTON "NEW" SPUN IRON PIPE -WILSON SELF-ADJUSTING JOINT

The Stanton Ironworks Company Limited, Near Nottingham

Gas Light and Coke Company (No. 2) Bill

House of Commons Committee—Monday, May 4

(*Before Sir* RICHARD MELLER (*Chairman*), *Captain* O. PEAKE, *Mr.* R. RANKIN, *and Mr.* F. B. SIMPSON.)

The Committee proceedings in connection with the Gas Light and Coke Company's No. 2 Bill opened at Westminster on Monday, May 4. The Bill represents another step in the Company's efforts to ensure for the tenants or purchasers of buildings erected by the public Housing Authorities within its area of supply freedom of choice as to the medium of light, heat, power, and energy they should use. By the Company's Act of 1933 such authorities were prohibited from imposing restrictions upon the tenants or owners of such buildings as to the form of light, heat, power, and energy they should use. In order to prevent circumvention of the provisions of that Act, the present Bill seeks to provide that the housing authorities shall afford facilities for the provision of gas pipes in buildings in the process of erection (see "JOURNAL," Dec. 11, 1935, p. 780).

The Company was represented by Mr. W. E. Tyldesley Jones, K.C., Mr. F. J. Wrottesley, K.C., Mr. Jacques Abady, K.C., and Mr. H. Royston Askew.

There was opposition by the Battersea and other Metropolitan Borough Councils and Barking and other Corporations; by Brentford and Chiswick Corporation; Finchley Corporation; Hackney Metropolitan Borough Council; and the Heston and Isleworth Corporation. All these opponents were represented by Mr. J. H. Thorpe, K.C., Mr. A. M. Trustram Eve, K.C., and Mr. E. J. C. Neep. The West Ham Corporation also opposed, and was represented by Sir Lynden Macassey, K.C., and Mr. E. Macassey.

Mr. W. E. TYLDESLEY JONES, K.C., opening the case for the Bill, said that formerly a large number of local authorities who had to provide houses or other buildings were in the habit of imposing restrictions upon their tenants with regard to the form of light, heat, power, or energy they should use; more especially, and chiefly, that was the case where the local authority had an electrical undertaking, and it had become the habit for such local authorities to try to tie the tenants of their houses to the electrical undertakings. Parliament had intervened, however, on several occasions to prohibit action which was in direct violation of the rights of the tenants to choose whether they would use gas or electricity as a medium for lighting, heating, and cooking.

Discussing the standing of the Gas Light and Coke Company, Counsel said that it supplies gas to-day over an area comprising 540 sq. miles. Within the area there were 31 electricity undertakings owned by the local authorities, 16 of them being outside London and 15 inside. Other local authorities might become the owners of electricity undertakings in their areas in the future, as they had the right to buy them from the companies at present operating them. The Gas Company's share capital exceeds £26,000,000, and its outstanding debenture stock exceeds £17,000,000.

The matter with which the Bill was concerned, continued Counsel, arose in 1925, when the Newport (Mon.) Corporation had promoted a Bill to authorize street improvements in the Borough and had sought power to purchase land compulsorily for the purpose. The Corporation had also sought power to let out and develop lands belonging to them and on such lands to erect houses, shops, warehouses and other buildings and to sell, let, or exchange the buildings and shops so erected. The Newport Gas Company had opposed the Bill and had proved before a Committee that the Corporation were in the habit of inserting, in agreements for letting houses erected by them under the Housing Acts, a clause requiring the tenant to use electricity only for lighting purposes. The Corporation owned the electricity undertaking. The Committee had taken a serious view of the matter and had inserted a sub-clause prohibiting the Corporation from imposing conditions with respect to the form of light, heat, power, or energy to be used in the properties in question. In 1930, when the Newport Corporation had promoted another Bill for street works, they had on their own initiative inserted the restrictive clause.

Government Housing Bill.

In connection with the Government Housing Bill of 1930 a proposal was made, in Standing Committee, to insert in the Bill a clause prohibiting the making of conditions limiting the tenants of local authorities' houses as to the use of any particular form of light, heat, or power. The clause was opposed by the Government of that time, and the speakers had opposed it in the interests of municipal trading. In the House, the clause was rejected again.

In 1932 the Kettering Gas Company had promoted a Bill to prevent the Kettering Urban District Council, who owned an electrical undertaking, imposing restrictive conditions on the tenants of their premises. The U.D.C. had petitioned and had opposed on seconding reading. There was a very strenuous debate, in which members of every party had spoken in favour of the Bill; one of the most vehement supporters of it was the Member for the Plaistow Division of West Ham—a member of the party who represented largely those affected by the restrictions. The feeling in the House had become so clear that the opponents of the Bill had not carried it to a division. The Bill was read a second time; the U.D.C. had withdrawn their petition and would not go to a Committee. In the House of Lords the U.D.C. did not venture to oppose.

Continuing, Counsel said that the Bill now before the Committee was not promoted in the interests of the Gas Light and Coke Company alone. Its real *raison d'etre* was that the tenants, who were largely working-class people, should be absolutely free to choose what they liked, and not that they should be compelled or induced to take gas.

In 1933 the Gas Light and Coke Company had promoted a Bill, in substantially the same form as the Kettering Bill, to prohibit the imposition of restrictive conditions by local authorities. But the Gas Light and Coke Company's Bill went further, for it made the prohibition of restrictions retrospective, the restrictions in the then existing agreements being rendered null and void. In the Bill, as promoted, it was also sought to prohibit the local authorities from doing "any other act or thing which would prevent or be likely to prevent any person owning or occupying any such building or any part thereof or any such land from taking and using in or upon such buildings or part thereof or such land any particular form of light, heat, power, or energy from any particular local authority, company, body, or person." That provision, however, had been criticized by some of the opponents to the Bill as being rather indefinite, and in view of that criticism he had withdrawn it when opening the case for the Bill. He had added, however, that if it were found hereafter that the Bill was insufficient to secure the object sought by the Company—*i.e.*, freedom of choice to the tenants—the Company would not hesitate to promote further legislation. The Bill, as passed, had been proved to be inadequate in practice to secure to the tenants fully the freedom to which they were entitled, and the purpose of the present Bill was to secure complete freedom.

In connection with the 1933 Bill the London County Council had urged that they ought to have some right to say in which part of a room the lighting point should be fixed. That was reasonable, and the Company had assented to a sub-clause to that effect. Although the Bill had not been opposed on second reading in the House, a large number of petitions were presented, by most of the local authorities concerned in London, including the London County Council and the Westminster City Council (but not the City of London), and by a large number of the authorities outside London. It had been proved that some local authorities, in order to prevent their tenants obtaining gas, had even sawn through the gas pipes, regardless of the danger of explosion; some of the tenants were not even informed of what the authorities were doing.

Similar Bills.

Counsel also referred to a similar Bill, promoted by the Commercial Gas Company in 1933, which was also passed; the petitioners had not proceeded with their opposition after the decision on the Gas Light and Coke Company's Bill. In 1934 a Bill for the same purpose was promoted by the Brighton, Hove, and Worthing Gas Company, and, although strenuously opposed by the Brighton Corporation, it had become law. In that year also a clause was inserted, at the instance of the Board of Trade, in the Gas Undertakings Bill, whereby local authorities were prohibited from restricting the right of owners or occupiers of their premises to take a supply of gas. Thus, the provision was applied to the whole country.

Private landowners, of course, did give their tenants freedom. The people whom it was sought particularly to protect were those who could not pick and choose their houses and could not stand out for their rights, because in a large number of cases there was shortage of houses. A practice which had grown up among some local authorities who owned electricity undertakings was to build their houses, wire them for electricity, and to tell a prospective tenant that if he wanted to use electricity he could have a house at once, but if he wanted to use gas he must wait, for there were none ready. Thus, a tenant who wanted a house at once was forced to accept an electrical house, and was compelled to sign an agreement to use electricity and to hire fittings over a period of two years. A very large number of the poorer classes in the Company's area of supply, who wanted houses provided with gas cookers, were thus compelled to use electric cookers. So that the electrical undertakings gained consumers, and the consumers did not get what they wanted.

Local Authorities and Working Class Houses.

Local authorities were becoming necessarily at an increasing rate the owners of a particular class of house in this country, for which purpose they used the rates and taxes. More and more the working classes would become dependent on the local authorities for their houses. Most of the local authorities in the Company's area of supply had loyally accepted the principle of the Company's 1933 Act, and had given their tenants freedom of choice. Others, however, had found a means of circumventing the Act. It was the practice of gas companies to carcass houses free of cost to the local authority or the public utility company or society which provided the houses. The procedure of some of the local authorities was to wire the houses for electric lighting, cooking, and heating, and to refuse

to allow the Gas Company facilities to put in gas pipes. The majority of local authorities, however, were reasonable, and when they were about to build houses they arranged for the Gas Company to carcass the houses at the same time. The wiring was also fitted, so that the tenants could use gas or electricity, or both, for different purposes. By carcassing the houses during construction much expense was saved as compared with carcassing after the buildings were completed, and the tenants avoided much inconvenience. In the case of one local authority in London the Company had had to make stern representations and to invoke the assistance of the Ministry of Health, and in other cases the Company had in various ways brought pressure to bear on local authorities to give the tenants freedom of choice.

During the four years 1932-1935, the Gas Company had negotiated with private builders for carcassing houses, the number of houses which were the subject of negotiations being 115,472. As a result, the Company had carcassed 112,785 during construction, there being only 2,687 which the Company had not been allowed to carcass during construction. During the same four years there had been negotiations with local authorities for the carcassing of 7,979 houses, and the negotiations were successful in respect of 7,167, so that only 812 were not carcassed during construction. It was manifest from those figures that the Company's aim was right and reasonable. The Company paid £513,750 in rates to the various local authorities in their area in 1935; in West Ham they had paid £58,170. Further, the Company employed over 24,000 people; they employed 1,660 persons in the West Ham Borough alone, yet that was one of the chief authorities placing difficulties in the Company's way.

Captain PEAKE (a member of the Committee) asked for an estimate of the capital costs of putting in gas pipes and of wiring for electricity.

Mr. JONES said he would provide estimates. He was informed that it was cheaper to carcass a house for gas than to wire for electricity, if it were done when the house was being built.

Continuing, he said that in West Ham as a whole there were 90,110 gas cookers in use and 5,768 electric cookers. Such figures indicated what the people wanted when they were free to choose.

The Company was quite confident, from the enquiries that were being made, that a very large body of the inhabitants of West Ham wanted gas, and many could not get it because the houses were not carcassed and the Company was not allowed to carcass them.

Counsel then dealt in detail with the provisions of the main clause of the Bill, emphasizing that under those provisions the Company could only require the housing authorities to give reasonable facilities; if the Company asked for something which was not reasonable, the housing authorities would be entitled to refuse it. If they could not agree, the matter could be referred to a Court of jurisdiction. He emphasized also that the pipes, when installed, would not be the property of the Company but would become part of the houses.

(The Committee adjourned until Tuesday.)

Practical Hints on the Installation of Heating Apparatus*

This little book has been written with the intention of assisting the craftsman in overcoming the many obstacles which arise in the course of his daily work. The text deals with many of the commonest forms of trouble that arise with various types of heating apparatus.

Chapters deal in turn with Heat, Ventilation, Open Fires, Troublesome Chimneys, Hot-Water Heating Apparatus, and Miscellaneous Heating Apparatus. The last-named includes gas-fired boilers, gas fires, gas radiators, and gas geysers, as well as electric fires.

* By E. G. Blake, M.R.S.I. The Technical Press, Ltd., 5, Ave Maria Lane, Ludgate Hill, E.C.4.

"Flame"*

"Flame," by O. C. de C. Ellis and W. A. Kirkby, of the Safety in Mines Research Board, is a welcome addition to Methuen's series of Monographs on Chemical Subjects. The introduction to the book takes the reader from the jet-flame to the flame that spreads through a prepared mixture of mutually reactive gases. The book proper offers a close analytical scrutiny of the conditions governing the ignition of such a flame and its propagation thereafter. Combustion is examined from the aerodynamical aspect; from the chemical aspect, discussing such problems as equilibrium shift under changing conditions of temperature and pressure, chain-reactions, the rupture of the molecule into radicles and atoms; and from the physical aspect.

A lengthy list of references adds to the value of the work.

* "Flame," by O. C. de C. Ellis and W. A. Kirkby; published by Methuen & Co., Ltd., price, 3s. net.

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The Bombay Gas Company, Ltd.

The Annual Ordinary General Meeting of the Proprietors of the Bombay Gas Company, Ltd., was held at the Registered Offices of the Company, Moorgate Station Chambers, E.C., on Wednesday, April 29, 1936—Mr. WILLIAM GRAHAM BRADSHAW, C.B.E. (Chairman of Directors), presiding.

The SECRETARY (Mr. E. Comber) read the notice convening the meeting, together with the reports of the Auditors; and the Directors' report and statement of accounts for the year ended Dec. 31, 1935, were taken as read.

THE CHAIRMAN'S ADDRESS.

The CHAIRMAN, in moving the adoption of the report and accounts, said:

Gentlemen, we have pleasure in presenting to you to-day a Statement of Accounts and Balance Sheet which reveals the Company as being in a more prosperous condition than at any time during its history, which dates back to the year 1862.

Before examining these Accounts I will endeavour to give you a brief résumé of the Company's affairs.

During the year under review peaceful conditions have prevailed in Bombay, and, as a direct consequence of the absence of internal commotions, an atmosphere of confidence has been slowly but surely gaining ground. These improved conditions are not only reflected in this Company's business but in the trade of Bombay in general, which, we are told, is definitely on the upward trend. Moreover, both the Government of India and the Bombay Legislative Council have shown a surplus in their respective budgets for 1936-7. The Government of India's budget showed a surplus of 242 lacs (£1,816,000), though the surplus expected was only 6 lacs. The action of the Finance Minister in reducing the surcharge of Indian Income-Tax by one half, lowering it from 16⅔% to 8⅓%, was a gratifying feature of the budget, and is a further proof of the continued improvement in the economic condition of India. Based on last year's assessment the Company will benefit by this reduction to the extent of about £1,000

The staple industries of Bombay have begun to show signs of improvement. The large Textile Milling Industry, which has suffered so much during the past ten years, has distinctly recovered some part of its former prosperity, and although profits have been small the mills have been well employed.

Shipping, too, the second largest industry in Bombay, although still far from prosperous, has improved somewhat, and there is a general air of hopefulness in the City which gives encouragement and augurs well for the future, if the existing absence of disturbances and riots continues.

Building Trade Boom.

Our General Manager reports that the outstanding improvement in business has been in the construction of new buildings, and he states that there is a distinct boom in the building trade in Bombay, which is very welcome news to the Directors and shareholders of a Gas Company.

We must not be too optimistic, but it seems evident that India, and Bombay in particular, are entering upon a phase of economic and industrial recovery. Apparently there will be nothing spectacular in this recovery; but judging from the utterances of those "on the spot" there are distinct signs of a gradual return to pre-war prosperity.

The financial strength of India is unquestioned. In the early part of 1935 a 3% Loan of £10,000,000 Sterling was issued successfully. Exports are increasing, and the visible trade balance is substantially higher.

Competition in all branches of industry becomes keener and more severe year by year, and the Gas Industry is not without its anxiety in this direction. In Bombay the prestige of the Company stands at a high level, and, thanks to the efforts of our General Manager and his assistants, our relations with both the Municipality and the Bombay Electric Supply and Tramways Company continue to be most friendly. Our representatives do all in their power to foster the spirit of co-operation which is so essential in these days of "cut-throat" competition.

In spite of the efforts of our competitors, the number of consumers has increased in the year by 444 to a total of 8,311, while the sale of gas for domestic purposes shows an increase of 15 million cu.ft., or 5·7%, which is the highest increase recorded since the year 1927. Last year the increase was 12 million cu.ft., or 4·7%, so that the increase of 1935 over that of 1933 is more than 10%. The total sale of gas for the year 1935 comes out with an increase of 3·3%, against increases of 2·2% and 2·3% respectively for the years 1933 and 1934. It has been difficult enough lately to maintain our position and to show each consecutive year increases in sales is, I venture to state, no mean achievement. The maintenance of these annual increments reflects credit on those responsible for the furtherance of the Gas Industry in Bombay.

Mr. Comber had been examining the other day the statistical record of gas sales over the past twenty years, and drew my attention to the fact that since the year 1915, when the total gas sold was 250 million cu.ft. per annum, the Company has increased its sale by 100%, the sale to-day being just over 500 million cu.ft. per annum.

Reduced Hire Rates.

In order to encourage new business and also in response to our General Manager's recommendations, we have sanctioned reductions in the hire rates for certain cookers and geysers, and we have also reduced the meter rentals of some of the larger size meters. The special sliding scales of charges which we have granted from time to time to large consumers are bearing fruit, and the showroom and the excellent service afforded to the consumers—which the General Manager calls his "Super Service"—are contributing to the increasing development of the Company's business.

The increases now taking place have already necessitated the extension of the distribution system. Some four miles of new mains were laid during 1935, in addition to many repairs, replacements, and enlargements of old and defective mains and services. As a consequence the expenditure on repair and renewal of mains and services shows an increase of £2,823. All expenditure on such work, as well as on the installation of meters and stoves, has been charged to the revenue account, thus relieving capital to the extent of £4,392. I am sure you will agree that this is a prudent policy to pursue.

That the progress of the Company is advancing is evidenced by the fact that during the month of January this year we were asked by our General Manager to place orders for meters, cookers, geysers, and so on to the value of some £7,000. This is equal to 50% of the total value of our purchases upon these appliances for the whole of last year, a fact which, I think, speaks for itself.

The Back Bay Reclamation Schemes, of which one has heard and read so much for many years past, are at last becoming a reality. A new Parade along the Chowpatti foreshore has been completed and named the Marina, and the Company has been called on to lay 2,800 yards of 4 in. main and to erect some 104 5-light suspension lamps, which shortly will be showing forth the merits of street lighting by gas. At present there are no buildings along the Marina, but in time to come no doubt building activities will commence here, and the Company will doubtless obtain its fair quota of business.

The Fittings Department has had a very busy year on both the domestic and industrial side, and some 1,980 gas appliances have been issued.

In the residual market competition from Cess coke continues unabated, while the Bengal hard coke from the large coke ovens which have been recently erected in Bengal is being shipped to Bombay in increasing quantities. We have, however, in our blue water gas plant, a means of controlling our stocks of coke, and, when necessary, the plant is brought into operation to absorb some of the surplus coke. It also helps, of course, to maintain the market price of coke. The Company was able to dispose of almost the whole of the quantity of salable coke, and finished up the year with a stock of only 48 tons more than the previous year.

The market for tar was subject to severe competition, and credit is due to our Management in Bombay in having disposed of 311,000 gallons. The increase in the stock of tar is owing to large shipments from Calcutta at the end of the year.

The Accounts.

If you will now kindly refer to the printed accounts we will proceed to examine the salient points therein. Coals have cost £1,028 more than the previous year, but we carbonized 874 tons more. There is an increase of £841 in the cost of repair and maintenance of works, which is mainly due to our having charged to that account the capital cost of a new multi-film static washer. Our General Manager strongly recommended this plant as being necessary to help in the elimination of ammonia from the gas. The increase of £5,578 under the heading of distribution is due to there having been charged to this account, to the relief of capital, the additional mains and services, meters, stoves and geysers, and fittings required by the increase in our business, as I have already explained. I need not point out again that this growth in our business is a very satisfactory feature in the record of the year.

There is a welcome reduction in the item of rents, rates, and taxes of £3,571. This, however, is not due to a reduction in the income-tax rate in either country, but is due to two refunds of double income-tax relief having been obtained and credited to this account during 1935. In other words, the refunds of Dominion Income-Tax due for 1934-5 and 1935-6 were both received in 1935. The Secretary found out from the Income-Tax Inspector that the date for obtaining the necessary Certificate

for sending to India could be accelerated so as to get the current relief included in the current year. It is in the nature of a " windfall " and will not be repeated.

General charges show an increase of £538 due to the Directors having deemed it wise to insure the Company's mains and works against civil commotions, fire, and explosions for a period of two years in order to make sure of a reasonable premium in view of the introduction of the Indian Constitutional Government. We do not, however, anticipate any trouble, our action being one of precaution only.

On the other side of the revenue account the sale of gas has produced an increase of £4,442, which I suggest is most satisfactory. The rental from meters is almost the same as last year, although some 444 more have been fixed, but, as I said, the rental of some of the larger meters has been reduced. The rentals from stoves and fittings shows an increase of £176, and would have been higher but for the fact that hire rates are smaller for certain types of geysers and water heaters.

The residual market is always a difficult one, and it is a matter for satisfaction that the position has been practically maintained.

The total revenue shows an increase of £4,988, while the total expenditure shows an increase of £5,491, leaving the working profit at only £503 less than that of last year at £24,233. It covers the dividend, however, for the year amounting to £24,000 without any help from the benefit on exchange.

The net revenue account shows that we have derived more benefit from remittances due to more money having been received and, in a lesser degree, to slightly better rates of exchange. We have placed £2,318 and £460 to the reserve and renewal funds respectively, making the total of these two funds £58,363.

Finally, there is an available balance of £58,454 0s. 2d., and after providing for the final dividend of 4½% which we recommend—which will absorb £13,500—there remains a sum of £44,954 0s. 2d. to be carried forward to the current year, which is an increase of £2,796.

The Balance-Sheet.

The principal item of interest in the balance-sheet is the increase of £11,643 in the cash on deposit and in hand, which now amounts to £26,553, in addition to the amount invested of £19,420 12s. 2d. When one remembers that only a few years ago the Company was indebted to its Bankers for as much as £40,000, the present position manifests a very satisfactory state of affairs. The increase of £1,880 in the amount due by the Company is brought about mainly by our having provided for that part of the income-tax assessment for 1935-6, which rightly belongs to the year 1935.

The capital account remains the same as last year. The capital spent per million cu.ft. sold works out at £723 per million cu.ft., which is the lowest figure yet recorded.

As to the future prospects of the Company it is always dangerous to prophesy. I can only say that the outlook to-day is brighter than it was a few years back, and, provided no untoward incidents occur to create setbacks, there does not appear to be any reason why the Company should not continue to progress. I mentioned last year that we had arranged for the supply of our coals as far ahead as the year 1940 at satisfactory prices and that our public lighting contract had been renewed to February, 1941. We shall have to meet some increased capital expenditure on mains, meters, and heating appliances if the same rate of progress continues; otherwise I cannot see any abnormal expenditure arising for some time to come. The works and plant are in a first-class condition, and are kept in a good state of repair, while their cleanliness and orderliness have been commented upon by several friends who have visited and inspected the works. Mr. Lane has compiled a short account of the works and has suggested that you might each like to have a copy of the brochure, which you will find is interesting reading.

That, gentlemen, is a short résumé of the affairs of the Company, and our best thanks are due to Mr. Lane, our General Manager in Bombay and Engineer, and to the European and Indian Staffs for their efforts in bringing about these satisfactory results.

The CHAIRMAN thereafter formally moved the resolution for the adoption of the report and accounts.

This was seconded by the DEPUTY-CHAIRMAN (Mr. H. H. Macleod), and, there being no comments from any of the shareholders present, it was put to the meeting and carried unanimously.

Dividends.

The CHAIRMAN then proposed the declaration of a final dividend at the rate of 4½% (less income-tax at the rate of 2s. 6·5d. in the £), making, with the interim dividend already paid, a dividend for the year of 8% (less income-tax).

This was seconded by Mr. A. M. PADDON, M.Inst.C.E., and unanimously agreed to.

Re-Election of Directors and Auditors.

The CHAIRMAN, in moving the re-election of Mr. H. H. Macleod, one of the Directors retiring by rotation and offering himself for re-election, said that Mr. Macleod was a Director of the greatest value to the Company, particularly in assisting them in making their coal contracts, and in many other ways as well.

Mr. PADDON, in seconding, remarked that they would not be unmindful of the value of some experience in the East, and Mr. Macleod brought them a great deal of such experience, which was a considerable asset to the administration.

The CHAIRMAN also moved the re-election of Mr. PADDON, the other Director retiring by rotation. Mr. Paddon was, he said, a gentleman of very great value to the Company.

Mr. MACLEOD seconded, and, both resolutions being unanimously carried, the two gentlemen respectively returned thanks for their re-election.

On the proposition of Mr. A. DICKSON, seconded by Mr. F. R. SMITH, the retiring Auditors (Mr. Alfred Morland, F.C.A., and Mr. Frederick J. Bradfield, F.C.I.S.) were unanimously re-appointed for a further twelve months; and Mr. BRADFIELD duly acknowledged their re-election on behalf of himself and his colleague.

Votes of Thanks.

The CHAIRMAN then moved a hearty vote of thanks to the Company's officers, staff, and workpeople both in Bombay and London. Their General Manager in Bombay and Engineer, Mr. W. T. Lane, who had been with them for so many years, was known personally to most of the shareholders present that day, so that it would be superfluous to speak to them of his merits, which, however, were many and outstanding. He could assure those shareholders who had recently purchased the Company's shares, however, that in Mr. Lane the Company had as its Chief Officer and Representative in Bombay a most zealous and efficient General Manager and Engineer, of whom any gas undertaking might be proud. He joined the Company in October, 1900, and it was no exaggeration to say that his whole life ever since had been bound up in the prosperity of the Company. They were much indebted to him. His great ability and knowledge and his long experience were devoted to the interests and advancement of the Company, and they had to thank him for a large part of the improvement which had taken place in it during the last few years.

In Mr. Boulter, the Assistant Manager and Engineer, they had a young and able assistant who had already proved his worth, while in Mr. Gladstone, the Deputy-Assistant Manager and Engineer (whose services they shared with their sister company at Calcutta) they had one who filled a difficult position with credit. In Mr. Woodford, the Accountant in Bombay, the Company had an experienced and able custodian of an important part of its finances, and that he was efficient in that direction was evidenced by the small amount of bad debts—which last year were only £28. In Mr. Sherret, the Works Superintendent, Mr. Woods, the District Superintendent, Mr. Blackmore, the Public Lighting Superintendent, and the other European Officers in India, the Company had men of zeal, enterprise, and energy. The Indian Staff served the Company faithfully and loyally, and he took great pleasure in saying that their interests were well cared for by the Company. They were well paid while on active service, and when the time came for retirement they did not go away empty-handed. In consequence, they reciprocated the Company's solicitude for their welfare by excellent and reliable service.

He could not speak too highly or too gratefully, went on the Chairman, of Mr. Comber, who managed their affairs in London with great ability. He could testify, after a long experience of the accounts and business of joint stock companies, that his work was performed with zeal and efficiency. The announcement of the Budget the previous week, with the imposition of an extra 3d. on the income-tax, involved a fresh and rather intricate calculation of the amount to be deducted from the shareholders' dividends. This threw upon the London staff a very considerable burden, with a very short time in which to make the necessary changes, in so much that the Chairman suggested to Mr. Comber that, in the circumstances, he would ask them to postpone the payment of the dividend for a few days; but Mr. Comber declined the offer, saying that the work could be done by coming early and staying late, and that he and his staff would prefer to see it through. Consequently, the shareholders would receive their dividend at the usual date—namely, May 1. In the other members of the London staff they had zealous and efficient officers.

Mr. PADDON seconded the vote of thanks, which was cordially received by the meeting.

In reply, Mr. COMBER said he had much pleasure in acknowledging on behalf of Mr. Lane and his European and Indian staffs the vote of thanks for their work during the past year, which he could assure them they richly deserved. He also thanked them for coupling the London staff with that vote. As regards the kind remarks of the Chairman concerning both the Bombay and London staffs, he could only say that they, one and all, did their utmost in helping towards the success of the Company.

Mr. BERTRAM ELLIS proposed a hearty vote of thanks to the Chairman and his colleagues for the way they had looked after the interests of the Company during the past year. The shareholders must congratulate them on a very fine balance-sheet, and they tendered to them their sincere thanks.

The vote was seconded by Mr. H. F. HILLS, who remarked that the small attendance at that meeting was a compliment to the Directors and showed the confidence the shareholders had in them.

The vote of thanks was unanimously accorded, and the CHAIRMAN having duly acknowledged it, the meeting then terminated.

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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share Lists, see later pages)

Conditions at home continue to be favourable, but the political and financial outlooks abroad are still very uncertain and appear likely to remain so for some time to come. The break in prices on Wall Street added to the chaos last week, and though markets here are surprisingly firm there are many nervous investors who are marking time in the hopes of seeing the atmosphere clear a little before embarking on fresh commitments. Even the slightest sign of any improvement in the European situation would bring about a swift change-over to more active conditions with rising prices.

The number of transactions in Gas stocks and shares was considerably heavier last week, as doubtless many of the abovementioned investors are reverting to "safety-first" methods, and it will be seen in the Stock and Share List that on the London Exchange there were comparatively few issues in which dealings were not reported. Except, however, for the rise of 3 in Winchester Water and Gas to 117½ and a drop of 8 in Imperial Continental, prices on this Exchange were singularly unaffected. In the Supplementary List a feature was a gain of 5½ points in Romford ordinary to 170-180, business being done at 176.

It is satisfactory to note that since a year ago, despite the many vicissitudes of markets generally during this period, the values of gas stocks and shares have been well maintained. The following table gives 24 of the principal ordinary stocks with the prices ruling on May 3, 1935, and the quotations at the close on Friday last, and it will be seen that 15 show an increase, two are without change, while seven have depreciated. The large drop in Imperial Continental is, of course, due to the European political troubles, and the Commercial fall has been brought about by the slight reduction in last year's dividend.

—	1935. May 3.	1936. May 1.	Increase + or Decrease −.
Alliance and Dublin	128—138	150—160	+ 22
Barnet	165—170	167—172	+ 2
Bournemouth 7%	167—172	169—174	+ 2
Brighton 5%	153 - 158	155—160	+ 2
Bristol	118—120*	120—122*	+ 2
British	152—162	158—163	+ 3½
Cardiff	130—135	130—135	..
Commercial	109—114	99—103	− 10½
Croydon Sliding-Scale	155—160	158—163	+ 3
Gas Light units	27/—28/-	27/6—28/6	+ 6d.
Imperial Continental	210—220	157—167	− 53
Lea Bridge	172—182	175—180	+ ½
M.S. Utility	110 - 115	110—115	..
Newcastle units	25/—25/6*	25/9—26/3*	+ 9d.
Plymouth and Stonehouse	167—172	166 - 171	− 1
Portsmouth 4%	173—178	170—175	− 3
Sheffield	142—144*	147—150*	+ 5½
S.E. Gas Corporation	27/—29/-	26/6—28/6	− 6d.
South Metropolitan	131—136	124—127	− 8
South Suburban	128—138	131—136	+ ½
Southampton	114—119	113—118	− 1
Tottenham	148—153	149—154	+ 1
Uxbridge	150—155	153—158	+ 3
Wandsworth	155—160	158—163	+ 3

* At the local Exchange.

Current Sales of Gas Products

The London Market for Tar Products.

May 4.

There is little of interest to report in the Tar Products market, prices remaining as quoted on April 27 last, viz.:

Pitch, about 37s. 6d. per ton f.o.b.

Creosote, 5½d. per gallon.

Refined tar, 3¾d. per gallon in bulk at makers' works.

Pure toluole, about 2s. 7d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, about 1s. 8d.; and 90/160 pyridine, about 4s. 3d. to 4s. 6d.—all per gallon naked at makers' works.

Tar Products in the Provinces.

May 4.

The average prices of gas-works products during the week were: Gas-works tar, 21s. to 26s. Pitch—East Coast, 36s. to 38s. 6d. f.o.b. West Coast—Manchester, Liverpool, Clyde, 36s. to 38s. 6d.* Toluole, naked, North, 2s. 2d. to 2s. 4d. Coal-tar crude naphtha, in bulk, North, 8d. to 8¼d. Solvent naphtha, naked, North, 1s. 6d. to 1s. 6½d. Heavy naphtha, North, 1s. 1d. to 1s. 2d. Creosote, *ex* works, in bulk, North, liquid and salty, 4⅝d. to 4⅞d.; low gravity, 4⅜d. to 4⅝d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid 60's, 2s. 4d. to 2s. 6d. Naphthalene, £24 to £26. Salts, 100s. to 105s., bags included. Anthracene "A" quality, 3d. to 3½d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *May* 2.

Prompt supplies are still scarce and further business continues difficult. As is usual at this time of the year distillers are devoting their attention to the sale of road tar.

Crude gas-works tar.—The actual value is 34s. to 35s. per ton *ex* works in bulk.

Pitch.—Quotations are unchanged at 35s. to 37s. 6d. per ton f.o.b. Glasgow for export and 35s. per ton *ex* works in bulk for home trade.

Refined tar.—County schedules are being filled up on the basis of 3¾d. to 4d. per gallon *ex* works in buyers' packages, but this material can still be obtained for export at 3d. to 3¼d. per gallon, f.o.r.

Creosote oil.—Demand continues steady and prices are unchanged as under: B.E.S.A. Specification, 5¼d. to 5⅝d. per gallon; low gravity, 5¼d. to 5½d. per gallon; neutral oil, 5¼d. to 5½d. per gallon; all *ex* works in bulk.

Cresylic acid.—Little or no business is being conducted for want of prompt supplies. Prices are nominal as follows: Pale, 97/99%, 1s. 9d. to 1s. 10d. per gallon; dark, 97/99%, 1s. 7d. to 1s. 8d. per gallon; pale, 99/100%, 2s. to 2s. 3d. per gallon; all *ex* works naked.

Crude naphtha.—Available supplies command 5¼d. to 5¾d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is higher at 1s. 5½d. to 1s. 6¼d. per gallon, while 90/190 heavy naphtha is particularly scarce with value at round 1s. 1d. to 1s. 2d. per gallon.

Motor benzole is quoted in small quantities at 1s. 3½d. to 1s. 4d. per gallon.

Pyridines.—90/160 grade is 5s. to 5s. 6d. per gallon, and 90/140 grade is 5s. 6d. to 6s. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole	0 8½	to	0 9	per gallon at works
Motor ,,	1 2	,,	1 2½	,, ,, ,,
90% ,,	1 3	,,	1 3½	,, ,, ,,
Pure ,,	1 7	,,	1 7½	,, ,, ,,

Contracts Advertised To-Day

Coal.
Birstall Urban District Council. [p. 356.]

General Stores.
Leeds Gas Department. [p. 356.]

Lead Wool and Lead.
Leeds Gas Department. [p. 356.]

Lighting Goods (Mantles, Fittings, Lamps, &c.).
Leeds Gas Department. [p. 356.]

Paint and Painting.
Borough of Bexhill. [p. 356.]

Pipes, &c.
Leeds Gas Department. [p. 356.]

Retorts.
Wigton Rural District Council. [p. 356.]

Tinplates, Galvanized Iron, &c.
Leeds Gas Department. [p. 356.]

Trade Notes

"Amal" Gas Nipples.

Messrs. Amal, Ltd., Perry Barr, Birmingham 20, have published a chart for the quick determination of nipple orifice for predetermined discharges of gas when the pressure and specific gravity are known. The chart—which is available on request to Messrs. Amal—should prove of considerable use to gas engineers.

Gas and coke production
with the best advantages
of scientific control ....

THE WEST SYSTEMS

- GLOVER-WEST VERTICAL RETORTS
- WESTVERTICAL CARBONIZING CHAMBERS
- COAL AND COKE-HANDLING & PREPARATION

Glover-West
verticals ordered
in 1936 by—

THE **DUDLEY,** BRIERLEY HILL & DISTRICT GAS CO. (3RD ORDER)
THE **KELSO** GAS COMPANY, LTD.
THE **ALTRINCHAM** GAS COMPANY (3RD ORDER)
THE **BILSTON** GAS LIGHT & COKE COMPANY (2ND ORDER)
THE **GRANGEMOUTH** CORPN. GAS DEPT. (2ND ORDER)
THE **JOHANNESBURG** MUNICIPAL GAS DEPT. (3RD ORDER)
THE **BALLYMENA** U.D.C. GAS DEPARTMENT (2ND ORDER)

THE SOCIETY OF BRITISH GAS INDUSTRIES · 1905 ·

WEST'S GAS IMPROVEMENT COMPANY, LTD.
MANCHESTER: ALBION IRONWORKS, MILES PLATTING
'Phone: COLLYHURST 2961 : 'Grams: "STOKER, MANCHESTER"
LONDON: COLUMBIA HOUSE, ALDWYCH, W.C. 2
'Phone: HOLBORN 4108 : 'Grams: "WESGASCO, ESTRAND, LONDON"

STOCK AND SHARE LIST

Official Quotations on the London Stock Exchange

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations May 1.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,767,439	Stk.	Mar. 16	7	7⅜	Alliance & Dublin Ord. ...	150—160	...	...
374,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb. ...	95—100	...	...
557,655	,,	Feb. 17	7	7	Barnet Ord. 7 p.c.	167—172	...	169
300,000	1	Mar. 30	1/4½	1/9½	Bombay, Ltd.	1½—1¾	...	27/—27/3
179,305	Stk.	Mar. 2	9½	9½	Bournemouth sliding scale ...	218—228	...	223½—225
590,407	,,	,,	7	7	Do. 7 p.c. max. ...	169—174	...	172
493,960	,,	,,	6	6	Do. 6 p.c. Pref. ...	148—153	...	150
50,000	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	85—90	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	105—110	...	108—108½
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	125—130	...	...
357,900	,,	Feb. 17	7½	7½	Brighton, &c., 6 p.c. Con. ...	170—175	...	...
649,955	,,	,,	6¾	6¾	Do. 5 p.c. Con. ...	155—160	...	158¾—159¾
205,500	,,	,,	6	6	Do. 6 p.c. 'B' Pref.	144—149	...	...
855,000	,,	Mar. 2	7	8	British Ord.	158—163	...	...
100,000	,,	Dec. 16	7	7	Do. 7 p.c. Pref. ...	153—158	...	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. 'B' Cum. Pref.	110—115	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	96—101	...	99¾
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	107—112	...	...
200,000	,,	,,	17/6§	3½	Do. 3½ p.c. Red. Deb. ...	98—100	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	28/—30/-
100,000	10	6 Nov. '33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	Jan. 6	4½	4½	Do. 4½ p.c. Deb. ...	81—86	...	82
626,860	,,	Feb. 3	6	6	Cardiff Con. Ord.	130—135	...	...
237,860	,,	Dec. 16	5	5	Do. 5 p.c. Red. Deb.	110—115	...	...
98,936	1	Apl. 20	2/-	2/-	Colombo, Ltd., Ord.... ...	1⅜—1⅞*	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	20/—22/-*	...	...
609,204	1	Mar. 30	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	18 6—20/6	...	...
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref	22/6—24/6	...	22/6
1,775,005	Stk.	Feb. 3	5	5	Commercial Ord.	99—103	...	99—101
620,000	,,	Dec. 2	3	3	Do. 3 p.c. Deb. ...	85—90	...	86¾
286,314	,,	Feb. 17	5	5	Do. 5 p.c. Deb. ...	120—125	...	...
807,560	,,	,,	7	7	Croydon sliding scale ...	158—163	...	162
644,590	,,	,,	5	5	Do. max. div.	114—119	...	...
620,385	,,	Dec. 16	5	5	Do. 5 p.c. Deb.... ...	121—126	...	124½—125
239,000	,,	Feb. 3	5	5	East Hull Ord. 5 p.c....	107—110	...	107—107½
184,555	,,	Feb. 17	6	6	East Surrey Ord. 5 p.c.	130—135	...	...
176,211	,,	Dec. 16	5	5	Do. 5 p.c. Deb. ...	122—127	...	122
19,284,128	,,	Feb. 3	5½	5½	Gas Light & Coke 4 p.c. Ord.	27/6—28 6d	...	28/—28/6¼
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	89—92	...	90¼—91
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	105—108	...	106½—107½
8,602,497	,,	Dec. 2	3	3	Do. 3 p.c. Con. Deb. ...	87—92	...	87½—90
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	117—120	...	117¾—118½
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	114—117	...	115½—116½
270,466	,,	Feb. 17	6	6	Harrogate New Cons. ...	130—135	...	...
157,500	1	Mar. 16	1/7½	1/7½	Hongkong & China, Ltd. ...	1 7/8—1 15/16	...	24/6
213,200	Stk.	Mar. 2	6	6	Hornsey Con. 3½ p.c. ...	135—140	...	135
5,600,000	,,	Nov. 4	14	8	Imperial Continental Cap. ...	157—167	—8	159—169
223,130	,,	Jan. 20	3½	3½	Do. 3½ p.c. Red. Debs.	92—97	...	...
285,242	,,	Feb. 17	8½	8½	Lea Bridge 5 p.c. Ord. ...	175—180	...	177—178½
165,736	,,	Mar. 16	8	10	Maidstone 5 p.c. Cap. ...	180—190	...	...
63,480	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	80—85	...	...
75,000	,,	Dec. 2	†10	†10	Malta & Mediterranean ...	200—210	...	...
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	102—107	...	...
231,978	Stk.	Feb. 17	5	5	M.S. Utility 'C' Cons. ...	110—115	...	112½—113½
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	...	...
360,075	,,	Dec. 16	4	4	Do. 4 p.c. Deb. ...	103—108	...	105½—106½
148,955	,,	,,	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
125,000	—	Jan. 2	3½	3½	Do. 3½ p.c. Rd. Rg. Bds.	96—99	...	...
675,000	Stk.	Nov. 18	†3	†3	Montevideo, Ltd.	67—72	+1	...
225,000	,,	Feb. 17	7½	7½	North Middlesex 6 p.c. Con.	169—174	...	171½—173
396,160	,,	Feb. 3	5	5	Northampton 5 p.c. max. ...	108—113	...	...
300,000	,,	Apl. 20	†9	†7	Oriental, Ltd....	165—170*	...	167—168½
416,617	,,	Dec. 16	8	8	Plymouth & Stonehouse 5 p.c.	166—171	...	...
504,416	,,	Feb. 3	8½	8½	Portsmouth & Gosport Cons.	170—175	...	...
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	108—113	...	...
114,000	,,	Feb. 3	5	5	Preston 5 p.c. Pref.	110—115	...	...
355,698	1	Apl. 20	1/-	1/-	Severn Va'. Gas Cor. Ld. Ord.	20 6—22/6*	...	22/—23/-
454,510	1	Mar. 16	-/10½	-/10½	,, ,, 4½ p.c. Cum. Pref.	21/—23/-	...	21/10½—22/3
133,201	Stk.	Feb. 17	8½	5	Shrewsbury 5 p.c. Ord. ...	147—152	...	...
90,000	10	27 May '35	†3	†3½	South African...	3¼—4¼	...	...
1,061,779	1	Sept. 23	1/2½	1/2½	South East'n Gas Cn. Ld. Ord.	26/6—28 6	...	...
845,016	1	Mar. 16	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	21 —23 -	...	...
200,000	1	,,	4	4	Do. 4 p.c. Cum. Pref. ...	20/9—21/9	...	...
450,000	Stk.	Feb. 17	4	4	Do. 4 p.c. Red Deb. ...	101—104	...	...
6,709,895	,,	Feb. 3	5	6½	South Met. Ord.	124—127	...	124—126
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf....	146—151	—1	146½—148½
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf....	104—107	...	104½—105½
1,895,445	,,	Dec. 16	3	3	Do. 3 p.c. Deb. ...	89—92	...	88—91
1,000,000	,,	Jan. 6	5	5	Do. 5 p.c. Red. Deb.	114—117	...	...
1,543,795	,,	Feb. 3	6	6	South Suburban Ord. 5 p.c....	131—136	...	133½—135½
512,825	,,	,,	5	5	Do. 5 p.c. Pref....	122—127	...	122—122½
500,000	,,	,,	4	4	Do. 4 p.c. Pref....	103—108	...	...
888,587	,,	Dec. 16	5	5	Do. 5 p.c. Deb....	123—128	...	126—127½
250,000	,,	,,	4	4	Do. 4 p.c. Deb....	104—109	...	...
415,907	,,	Dec. 2	...	4	S. Western Gas & Water Ord.	23'—24/-	...	...
160,523	,,	Apl. 20	...	4½	Do. 4½% Red. Cum. Pref.	21 9—22 9*	...	...
110,000	,,	Dec. 16	4	4	Do. 4% Red. Deb. ...	98—103	...	...
647,740	,,	Feb. 3	5	5	Southampt'n Ord. 5 p.c. max.	113—118	...	...
121,275	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	98—103	...	...
350,000	,,	Feb. 3	5½	5½	Swansea 5½ p.c. Red. Pref. ...	111—116	...	...
106,000	,,	Dec. 16	6½	6½	Do. 6½ p.c. Red. Deb. ...	96—101	...	...
94,000	,,	...	...	...	Do. 3½ p.c. Red. Deb. ...	96—101	...	...
1,076,490	,,	Feb. 17	6	6½	Tottenham and District Ord.	149—154	...	152—153¼
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref....	130—135	...	132½
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	125
371,850	,,	Dec. 2	4	4	Do. 4 p.c. Deb. ...	103—108	...	...
369,774	,,	Feb. 3	7	7	Uxbridge, &c., 5 p.c. ...	153—158	...	153
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	...
1,340,521	,,	Feb. 3	7	7	Wandsworth Consolidated ...	158—163	...	160—161
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	122—127	...	124½—125
1,317,964	,,	Dec. 16	5	5	Do. 5 p.c. Deb. ...	123—128	...	124½
338,300	,,	,,	4	4	Do. 4 p.c. Deb. ...	104—109	...	...
499,735	,,	Feb. 17	6¾	7¼	Watford and St. Albans Ord.	155—160	...	156—159
200,000	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
200,000	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	133—138	...	...
200,000	,,	Dec. 2	4	4	Do. 4 p.c. Red. Deb.	100—105	...	...
100,000	,,	,,	...	3½	Do. 3½ p.c. Red. Deb.	96—101	...	...
159,400	,,	Mar. 2	5	6b	Winchester W. & G. 5 p.c. Con.	115—120	+3	...

a.—The quotation is per £1 of Stock. b.—Paid £3, including 10s. on account of back dividends. * Ex div.
† Paid free of income-tax. ‡ For year. § Actual for three months.

Stock and Share List continued overleaf.

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STOCK AND SHARE LIST—Cont.

Stocks Officially Quoted on Provincial Exchanges

Issue. £	Stock or Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations. May 1.	Rise or Fall on Week.	Transactions, Lowest and Highest During the Week.
BRISTOL EXCHANGE.								
347,756	Stk.	Feb. 3	5	6	Bath Cons.	124—126	...	...
1,667,250	,,	Feb. 17	5	5	Bristol, 5 p.c. max.	120—122	+1	...
120,420	,,	Dec. 16	4	4	Do. 1st 4 p.c. Deb. ...	103—105	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	103—105	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	125—128	...	...
274,000	,,	Feb. 17	5	5	Newport (Mon.) 5 p.c. max....	111—116	...	...
13,200	12	Mar. 16	7	8½	Pontyp'l Gas & W. 10 p.c. 'A.'	14—15	...	...
13,600	10	,,	5	6	Do. 7 p.c. B.'	11½—12	...	...
40,000	10	,,	5	6	Do. 7 p.c.'C.'	11½—12	...	...
140,778	Stk.	Feb. 17	5	5	Weston-super-Mare Cons. ...	113—115	...	...
64,338	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	98—100	...	...
33,340	,,	,,	7½	7½	Do. 7½ p.c. Deb.	165—169	...	...
LIVERPOOL EXCHANGE.								
157,150	Stk.	Feb. 3	5	6½	Chester 5 p.c. Ord.	107½—112½	...	...
92,500	,,	Dec. 16	4	4	Do. 4 p.c. Pref.	100—105	...	...
32,540	,,	,,	3½	3½	Do. 3½ p.c. Deb. ...	91—96	...	...
41,890	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	100—105	...	...
2,167,410	,,	Feb. 17	6	6	Liverpool 5 p.c. Ord. ...	135—137	...	...
245,500	,,	Dec. 16	5	5	Do. 5 p.c. Red. Pref. ...	103—108	...	...
306,083	,,	Jan. 6	4	4	Do. 4 p.c. Deb. ...	105—107	...	...
106,280	,,	Feb. 3	10	10	Preston 'A' 10 p.c. ...	202—212	...	...
185,219	,,	,,	7	7	Do. 'B' 7 p.c.	140—150	...	...
NEWCASTLE EXCHANGE.								
122,577	Stk.	Mar. 2	8	8	Blyth 5 p.c. Ord.	154—156	...	...
732,000	,,	Feb. 3	5	5	Hartlepool G. & W. Co. & New	117—119	...	...
2,061,315	,,	Feb. 3	5	5½	Newcastle & Gateshead Con.	25·9—26·3a	...	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106½—107½	...	...
776,706	,,	Dec. 16	3½	3½	Do. 3½ p.c. Deb. ...	100½—101½	...	...
277,285	,,	Oct. 21	5	5	Do. 5 p.c. Deb. '43...	105—106	...	...
209,820	,,	Mar. 2	8½	8½	South Shields Con.	165—170	...	...
299,542	,,	Feb. 3	6	6	Sunderland 6 p.c. max. ...	129—131	...	...
NOTTINGHAM EXCHANGE.								
542,270	Stk.	Feb. 17	7	10	Derby Con.	176—186	...	...
55,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	100—105	...	...
84,750	,,	Feb. 17	5	12	Long Eaton 'A' Ord. ...	175—185	...	...
50,000	,,	,,	4	10	Do. 'B' Ord. ...	130—140	...	...
20,000	10	Dec 16	5	5	Do. 5 p.c. Pref. ...	10—12	...	...
80,000	Stk.	,,	5	5	Do. 5 p.c. Deb. ...	117—122	...	...
SHEFFIELD EXCHANGE.								
10,000	Stk.	Feb. 17	10	10	Great Grimsby 'A' Ord. ...	220—230	...	...
6,500	,,	,,	10	10	Do. 'B' Ord. ...	220—230	...	...
79,000	,,	,,	10	10	Do. 'C' Ord. ...	205—215	...	...
1,806,339	,,	Feb. 17	6	6	Sheffield Cons.	147—150	...	...
95,000	,,	Dec. 16	4	4	Do. 4 p.c. Deb.	100½—102½	...	...

a The quotation is per £1 of Stock.

Supplementary List of Stocks and Shares not Officially Quoted

202,152	Stk.	...	...	...	Ascot Ord.	119—124	...	...
128,182	,,	...	...	...	Do. 5 p.c. Pref.	117—122	...	...
238,631	1	Nov. 4	5	5	Assd. Gas and Water Ord. ...	21/—23/-	...	23/-
323,681	1	,,	4½	4½	Do. 4½ p.c. Cum. Pref. ...	22/—23/-	...	...
150,000	Stk.	...	...	...	Do. 3½ p.c. Red. Deb. ...	...	...	100¾—101
17,000	,,	Feb. 17	8	8	Bognor Orig. Ord. 'A' ...	175—185	...	...
62,210	,,	,,	8	8	Do. New Addl. 'A' ...	172—185	...	...
87,160	,,	,,	7	7	Do. New 7 p.c. max. ...	140—145	...	...
37,440	,,	Feb. 3	10	10	Cam.Univ. & Town 10 p.c.max.	210—220	...	...
125,970	,,	,,	7	7	Do. 7 p.c. max.	158—163	...	...
39,025	,,	,,	5	5	Do. 5 p.c. max.	108—113	...	...
65,000	,,	Mar. 2	7½	8½	Eastbourne 'A' 5 p.c. ...	160—165	...	...
198,000	,,	,,	6	7	Do. 'B' 3½ p.c.	133—138	...	...
112,312	,,	,,	5	5	Do. 5 p.c. Pref.	120—125	...	...
130,000	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
250,000	1	Nov. 18	...	4	Gas Consolidation Ord. ...	20 6—22 6	...	...
250,000	1	,,	...	4	Do. 4 p.c. Red. Cum. Pref.	19 6—20 6	...	19,9—19/10½
700,000	Stk.	...	...	...	Gas Light & Coke 3 p.c. Rd. Db	102—104	+1	103½—104
24,000	30	Feb. 3	8½	8½	Great Yarmouth 8½ p.c. max.	52—57	...	...
59,400	30	,,	7½	7½	Do. 7½ p.c. max.... ...	42—45	...	...
51,160	Stk.	Dec. 2	5½	5½	Do. 5½ p.c. Deb.... ...	123—128	...	...
152,600	,,	Mar. 2	8	8	Guildford Cons.	185—195	...	...
54,055	,,	,,	5	5	Do. 5 p.c. Pref.	114—119	...	...
68,250	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	120—125	...	...
156,600	,,	Feb. 3	7½	7½	Hampton Court Cons. ...	167—177	...	...
81,660	10	Feb 4,'35	5	9	Leatherhead Ord.	16—17	...	...
107,960	10	Mar. 16	4	5½	Mid Kent Ord. ... ... a	10—11	+½	...
230,940	Stk.	Feb. 17	10	10	Oxford & District Ord. ...	205—215	...	...
47,112	,,	,,	5	5	Do. 5 p.c. Pref.	118—123	...	...
50,000	,,	,,	6	6	Do. 6 p.c. Red. Pref. ...	113—118	...	...
126,193	,,	Nov. 18	7½	7½	Peterborough Ord.	160—170	...	...
64,990	,,	Mar. 16	7½	7½	Redditch Ord.	113—118	...	...
166,850	,,	Feb. 17	7	9	Romford Ord.	170—180	+5½	170½—176
60,000	,,	,,	4	4	Do. 4 p.c. Pref.	97—100	...	...
44,000	,,	Mar. 16	5	5	Do. 5 p.c. Deb.	120—125	...	...
10,950	,,	Mar. 2	8	8	Ryde Ord.	165—170	...	...
136,191	,,	Feb. 3	5	7	Scarborough Ord.	128—138	...	...
27,825	,,	Feb. 3	8	8	Shanklin & Ventnor Cons. ...	152—162	...	...
40,643	,,	Mar. 2	7	7	Slough Ord.	147—152	...	...
221,000	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	116—121	...	...
28,872	1	Nov. 4	5½	5½	S. Midland Gas Cpn.Ltd. Ord.	20/—22/-	...	...
28,866	1	Mar. 16	4½	4½	Do. 4½ p.c. Red. Cum Pref.	19 6—21 6	...	...
137,730	Stk.	Feb. 17	7	7	Southgate & Dist. 7 p.c. max.	148—153	...	...
62,500	,,	,,	5	5	Do. 5 p.c. Pref.	115—120	...	...
117,228	,,	Mar. 2	5	6	Swindon Cons.	111—116	...	...
60,425	,,	Dec. 16	5	5	Do. 5 p.c. Deb.	122—127	...	...
50,000	1	Mar. 30	...	5·52d.	a Utd. Kingdom Gas Cpn. Ord.	20/6—22/6	...	20,9—21/9
760,910	1	,,	2½	2½	Do. 4½ p.c. Prefd. Ord....	20/—22/-	...	...
110,910	1	,,	...	2½	Do. 4½ p.c. Cum. Pref. ...	21 —23/-	—.6	21/10½—22/3
900,000	Stk.	Mar. 16	...	3½	Do. 3½ p.c. Red. Deb. ..	98—101	...	...
30,000	,,	Feb. 3	5	8	Wakefield Ord.	140—145	...	...
81,650	,,	,,	5	5	Do. 5 p.c. max.	105—110	...	108½
500,000	,,	...	...	...	Wandsworth 4 p.c. Pref. ...	104½—106½	...	105¾—105¾
82,000	,,	Feb. 3	6	6	Weymouth Ord.	106—111	...	...
98,384	,,	Feb. 3	6	6	Wolverhampton 6 p.c. Pref.	127—132	...	...
160,000	,,	Dec. 16	5½	5½	Do. 5½ p.c. Rd. Db	107—112	...	...
370,000	,,	Feb. 3	4	6	York Cons.	108—113	...	...
90,000	,,	Dec. 16	5	5	Do. 5 p.c. Red. Deb. ...	103—108	...	...
133,640	,,	Feb. 3	6¼	6¼	Yorktown (Cam.) 5 p.c. Cons.	127—132	...	...
120,000	,,	,,	5	5	Do. 5 p.c. Pref.	115—120	...	...
35,000	,,	Dec. 16	5½	5½	Do. 5½ p.c. Deb.... ...	130—135	...	...

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